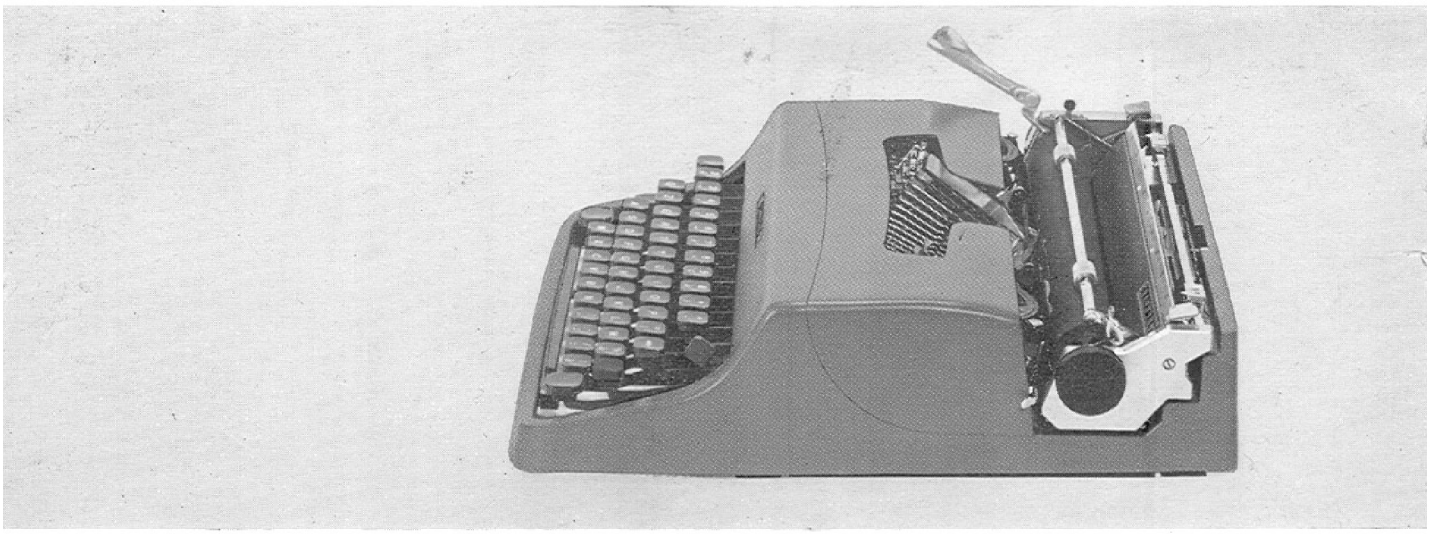


Olivetti Underwood Lettera 32

Carriage Locking Lever 16

When carrying the typewriter in its case, the carriage should be locked in center position by using lever **16** on the right-hand side.

Line Space and Carriage Return Lever 6

This lever returns the carriage from the end of the typing line to the left hand margin, and simultaneously rotates the platen, moving the paper up to the next typing line. When the typewriter is covered, or replaced in its carrying case, always fold the lever back; ease it to the left, and push it down.

Line Space Selector 8

The distance between the lines of typing is determined by lever **8**, which has four different positions. Position 0 disengages the platen from the spacing mechanism for typing between the lines or returning to a previous line.

Variable Line Spacing Knob 7

To disengage the platen from the spacing mechanism, press knob **7**. This is used to correct alignment when a sheet that has already been typed on is reinserted in the machine.

Margin Stops 10

To set the left-hand margin: move the carriage until the type guide **13** is immediately below the point at which you wish to begin typing. Depress and slide the left-hand margin stop to the right until it comes to a halt.
To set the right-hand margin: move the carriage to the left until the type guide is immediately below the point at which you wish to finish typing. Depress and slide the right-hand margin stop to the left until it comes to a halt.

Margin Release and Paragraph Indentation Key 4

It is possible to free the carriage to move outside either of the two margin stops by depressing key **4.** The same key, if held depressed while returning the carriage to the beginning of the next typing line, will stop the carriage approximately ½" from the left-hand margin.

Paper Release Lever 15

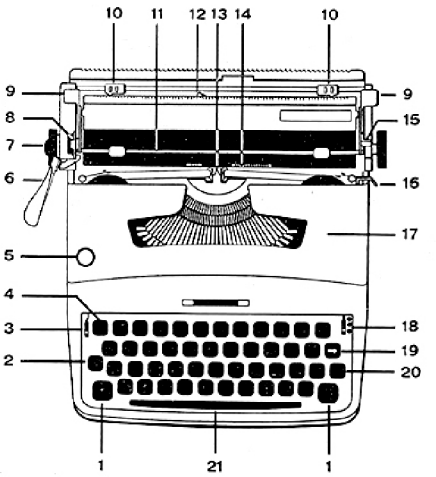
When pulled forward it loosens the paper under the platen. It is used to adjust the paper to the typing line, vertically and horizontally, after it has been inserted in the machine.

Space Bar 21

In addition to moving the carriage along a space at a time, the space bar may also be used to correct the accidental omission of a letter from a word, without having to erase the entire line. For example: if you have typed - **the vey good idea** - instead of - **the very good idea** - insert the missing **r** as follows: 1) Erase the word **vey.** 2) Set the carriage against the letter **e** of **the.** 3) Overtype the **e,** depress the space bar - and holding it down - type the letter **v.** 4) Let the space bar rise, depress it and again holding it down, type the letter **e.** 5) Type the letter **r** and **y** in the same way.

Using the Tabulator

The tabulator makes it easy to type columns of words or figures by stopping the carriage at the beginning



1 Shift Keys
2 Shift Lock
3 Tabulator Setting and Clearing Lever
4 Margin Release and Paragraph Indentation Key
5 Personal Touch Tuning
6 Line Space and Carriage Return Lever
7 Variable Line Spacing Knob
8 Line Space Selector Lever
9 Carriage Release Levers
10 Margin Stops
11 Bail Rod
12 Paper Supports
13 Type Guide
14 Line Finder
15 Paper Release Lever
16 Carriage Locking Lever
17 Detachable Top Cover
18 Ribbon Color Change and Stencil Lever
19 Back Space Key
20 Tabulator Key
21 Space Bar

of each column. Set (and subsequently clear) the tabulator stops with the tabulator setting and clearing lever **3**: you can then control the carriage movement from column to column with the tabulator key **20.**

To set Tabulator Stops

Move the carriage to the position in which you want the first letter (or number) of the first column. Move the tabulator setting lever **3** upward. Follow the same procedure to set tabulator stops for any additional columns.

To tabulate, once the tabulator stops have been set and you have begun typing, depress the red tabulator key **20** until the carriage is brought into position for typing the first letter of the next column.

To Clear a Single Stop

Bring the carriage to the stop in question with the tabulator key **20.** Move the tabulator clearing lever down and release it. To clear all the existing stops, hold the tabulator lever **3** down, while you move the carriage along its full length.

Printed in Italy 1 - 1964

Ribbon Color Change and Stencil Lever 18

By positioning this lever next to the blue dot you type on the upper half of the ribbon; by positioning it next to the red dot you type on the lower half. The white dot is used for typing stencils.

Detachable Top Cover 17

The easily detachable top cover **17** gives access to the ribbon spools, to the type faces (for cleaning), and to the personal touch tuning lever.

Personal Touch Tuning 5

The touch tuning lever will be found under the detachable top cover on the left-hand side, and will enable you to adjust the key tension to suit your touch. The highest position is the lightest, the lowest position is the heaviest.

Paper Supports 12

To raise the paper supports, press the small bracket which juts out at the bottom of them. They are particularly useful when you are typing several copies.

Ribbon Changing

Remove the detachable cover and wind the ribbon on to one of the spools. Slide the ribbon out of the ribbon vibrator, lift the two springs that hold the spools in place, and take the spools out. Hook the new ribbon on to the empty spool, and wind it until the metal eyelet, about 6'' from the end, is covered. Replace the spools on their spindles, and, checking that the lower half of the ribbon is the red part, repeat the previous operations in reverse.

Maintenance

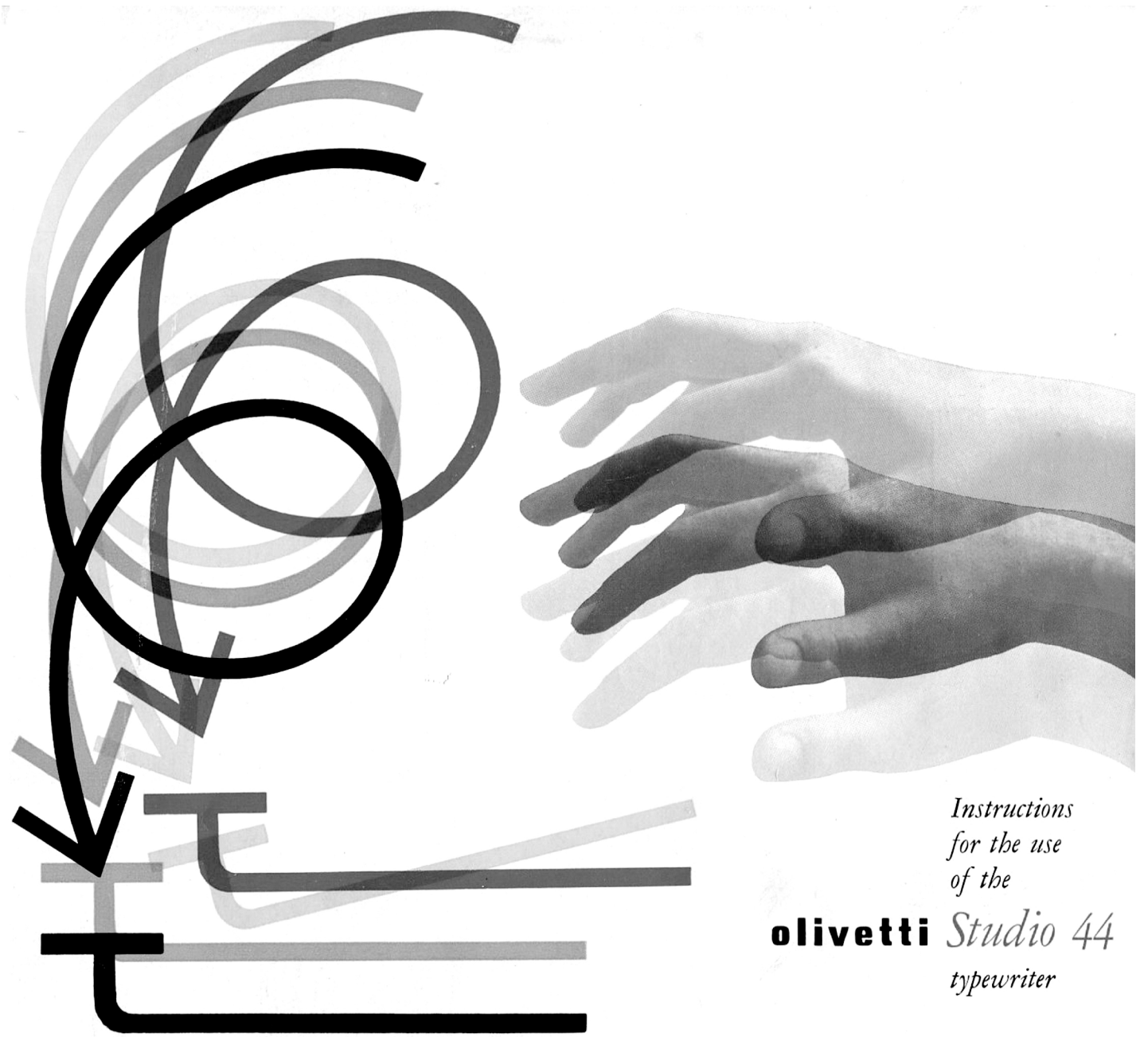
Cleaning the letters - If your typescript loses its usual crispness, the typefaces should be cleaned. Dip the nylon brush provided into a good typewriter fluid and clean each typeface individually.

Cleaning the platen - When necessary wipe the platen with a clean white cloth dipped in alcohol.

General Care

For service under the normal guarantee, take your typewriter to the nearest Olivetti Underwood branch or your dealer.

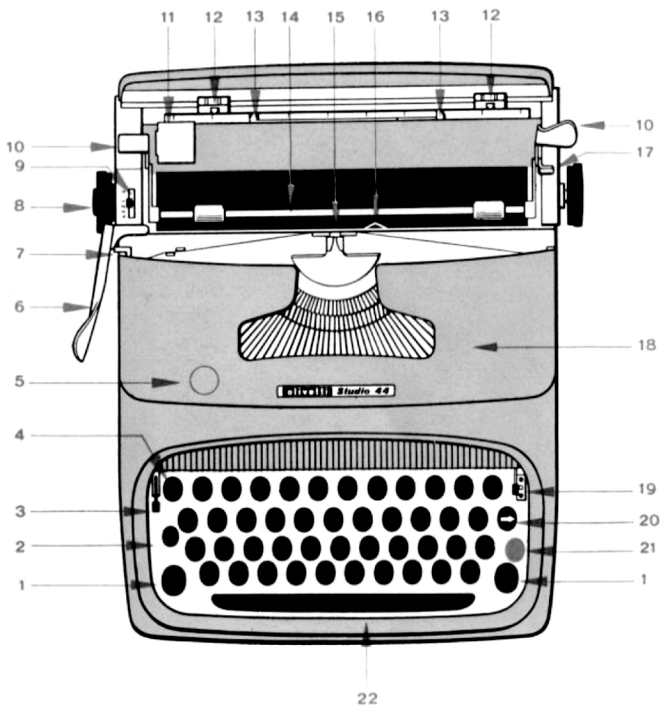
Cod. 3950897 G



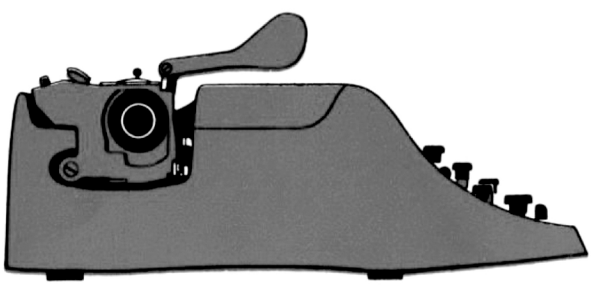
Instructions
for the use
of the

olivetti *Studio 44*

typewriter



1 **Shift Keys**
2 **Shift Lock**
3 **Tabulator Setting and Clearing Lever**
4 **Margin Release and Paragraph Indentation Key**
5 **Personal Touch Tuning**
6 **Line-space and Carriage Return Lever**
7 **Carriage Locking Lever**
8 **Variable Line Spacing Knob**
9 **Line Space Selector**
10 **Carriage Release Levers**
11 **Paper Guide**
12 **Margin Stops**
13 **Paper Supports**
14 **Bail Rod**
15 **Type Guide**
16 **Line Finder**
17 **Paper Release Lever**
18 **Detachable Top Cover**
19 **Ribbon Colour Change and Stencil Lever**
20 **Back Space Key**
21 **Tabulator Key**
22 **Space Bar**



To prepare the machine for use

After removing all the cardboard and paper packing, these simple preliminaries should be followed:

a) Move the *carriage return and line space lever* ⑥ into its working position.

b) Make sure that the *ribbon colour change lever* ⑲ is in the blue (or red) position.

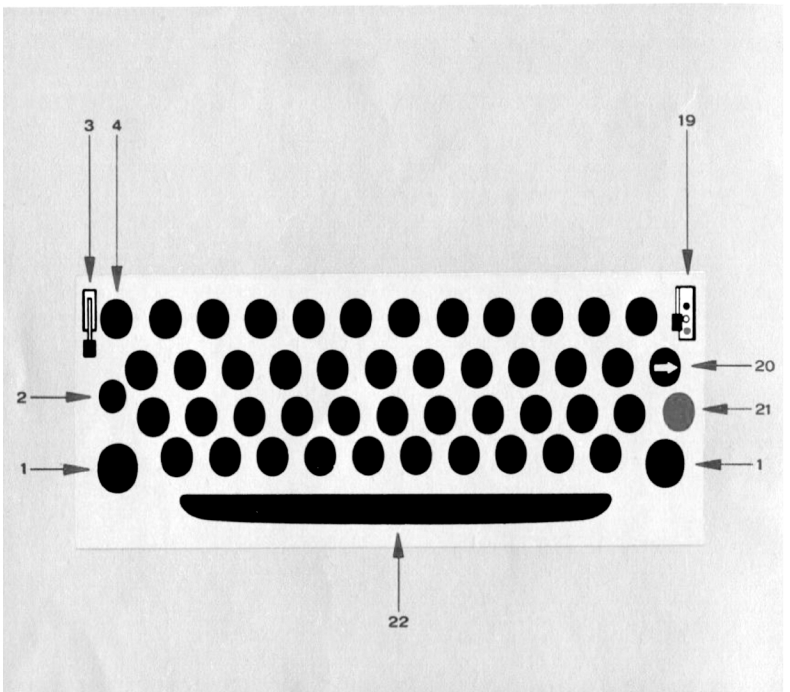
c) The *line space selector* ⑨ must be in one of the slots 1, 2, 3 or 4.

d) Make sure that the *margin stops* ⑫ are at apposite ends of the carriage.

How to insert the paper

To insert paper, lift the bail rod ⑭ and slide the paper behind the platen (roller), turning the platen until the paper emerges at the front. If the paper needs to be straightened, pull *paper release lever* ⑰ forward, adjust the paper and push back lever ⑰. The machine is now ready for use.

Keyboard



Shift Keys ①

To type capital letters, depress either of the two shift keys ①.

Shift Lock ②

Depress this key whenever you want to type continuously in capitals. To return to normal typing, depress either of the shift keys ①.

Back Space Key ⑳

Depress this key to move the carriage back one space.

Margin Release and Paragraph Indentation Key ④

This key serves a double purpose:

a) It enables you to type outside the limits set by either of the margin stops ⑫.

b) It gives automatic paragraph indentation. If kept pressed down while bringing the carriage back to the start of a new line, the carriage will stop just over one inch to the right of the set margin.

Space Bar ㉒

This moves the carriage one space forward to provide the space between words.

Horizontal half spacing

When the space bar is pressed down, the carriage moves a half space to the left; when it is released, the carriage moves another half space. This action is very useful when making a correction to insert an omitted letter, or when it is necessary to insert a shorter word in place of a longer one:

a) Inserting an omitted letter: — it was a vey good idea;
— it was a very good idea.

After erasing the error, position the carriage so that the printing point is immediately over the preceding space. Then depress the space bar and, while it is down, strike the letter desired. Release the space bar and repeat the process until the word is completed.

b) Reducing the space: — They have a good idea;
— They had a good idea.

Position the carriage to the space preceding the erased word, then space one full space followed by half a space thereafter using the same procedure as in example *a*).

Ribbon Colour Change and Stencil Lever ⑲

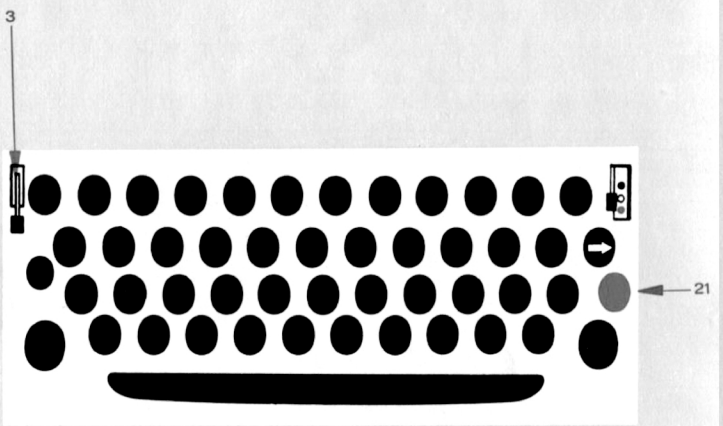
With the lever set opposite the blue dot, typing takes place on the upper half of the ribbon: when set opposite the red dot, typing takes place on the lower half. For stencil cutting, the ribbon is put out of action by setting the lever opposite the white dot.

Tabulator Key ㉑**. Tabulator Setting and Clearing Lever** ③

The tabulator makes it easy to type tables of words or figures in any arrangement of vertical columns, stopping the carriage automatically at the beginning of each column.
Once the number and position of columns required are known, a stop must be set for each of them.

To set the stops

Move the carriage to the point at which the *type guide* ⑮ coin-



Setting of tabulator stops

	Last name	First name	Address	Amount
Stops:	↓	↓	↓	↓
	Walker	David	67 Main Street	727
	Smith	John	34 Court House Square	110,834
	Hope	William	57 Elm Street	82,319
	Stevens	Larry	1 City Hall Square	6,100
	Greene	Andrew	34 West End Avenue	250
	Cooper	Edward	4 Canal Street	95
	Brown	Alfred	12 County Road	22,188

cides with the beginning of the first column you require. Then push the *tabulator setting lever* ③ *backward*. Next, move the carriage along to the place where the second column is required, and set the second stop in the same way, and so on with any further columns.

To tabulate

Once the stops have been set, and the carriage moved to the left margin, it is only necessary to depress the red *tabulator key* ㉑ to reach the beginning of the first column automatically. Type the appropriate words or figures, then depress the key again to arrive at the second column and so on.

In typing columns of numbers always set the stop for the largest number in your list and use the space bar to bring you to the right position in the column for any smaller number.

The example on the opposite page shows how to use the tabulator. When it is desired to change the arrangement of the columns, or to eliminate them entirely, the stops must be cleared.

To clear a single stop

To clear a single stop, bring the carriage to that stop by depressing the tabulator key, then pull the tabulator clearing lever ③ *forward*.

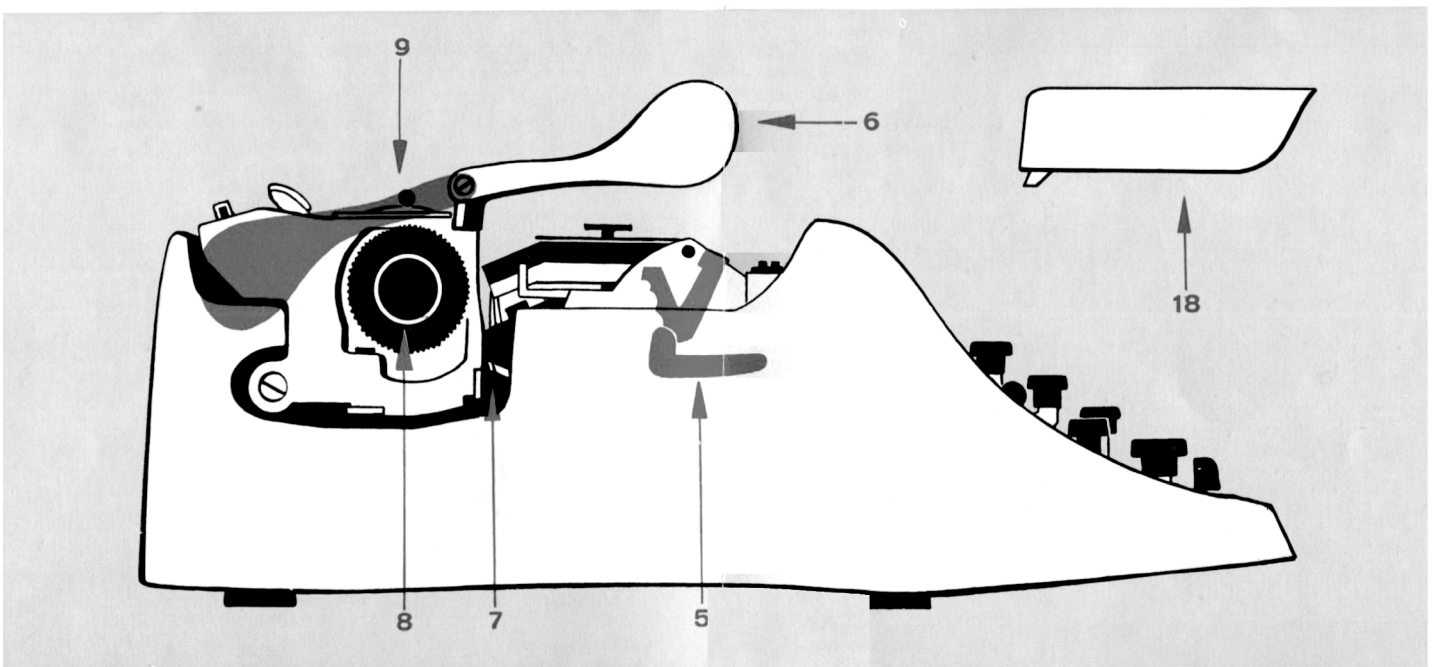
To clear all the stops

To clear all the stops at once, keep the tabulator clearing lever pulled forward while moving the carriage its full length by depressing the tabulator key.

Detachable Top Cover ⑱

To remove, hold the cover firmly at the centre and lift from the front. This gives access to the touch tuning device, to the ribbon spools and to the type for cleaning purposes.

Carriage



Carriage Locking Lever ⑦

This locks the carriage in the central position and prevents it from moving whilst it is being carried. The carriage should be locked every time the typewriter is put into its case.

Line-Space and Carriage Return Lever ⑥

The carriage return lever must be hinged forward when using the machine and folded back when replacing it in the carrying case. When brought forward into the working position, it is used to take the carriage back to the beginning of the writing line; at the same time it moves the paper up ready for typing a new line, according to the setting of the *line space selector*.

Line Space Selector ⑨

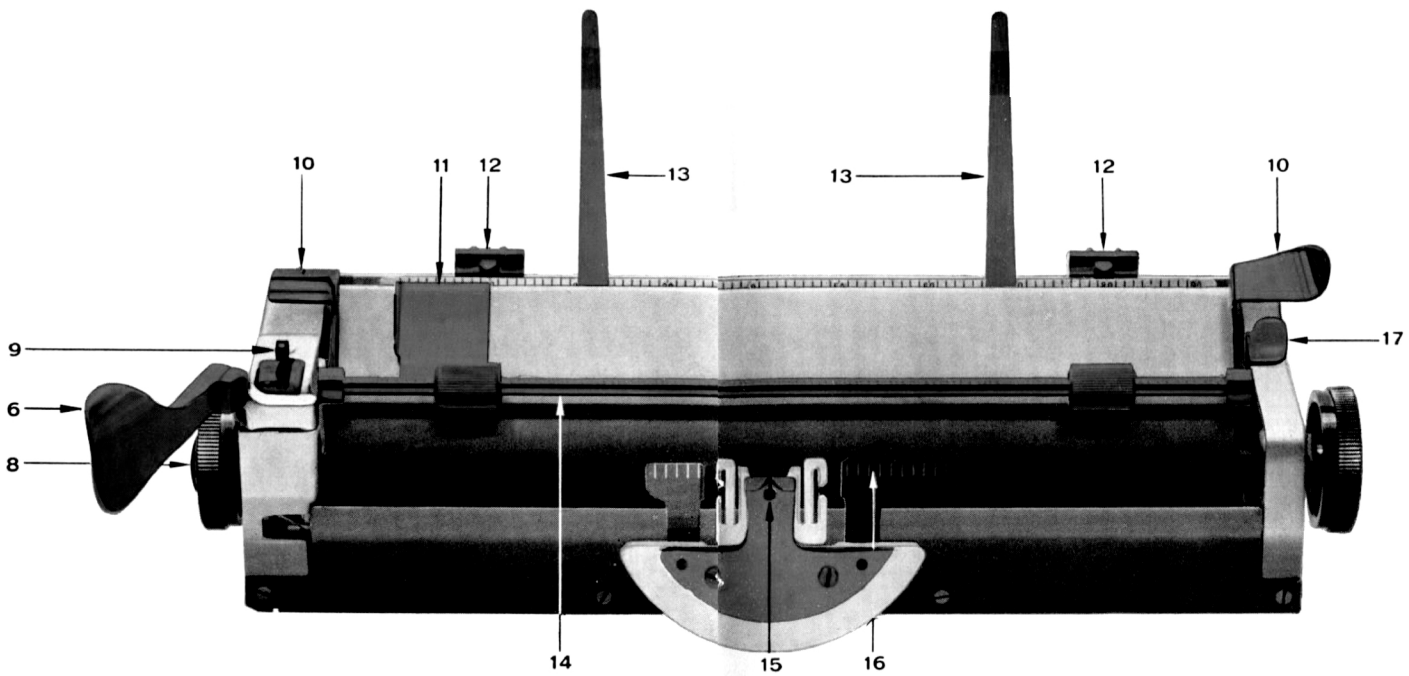
The distance between consecutive lines of typing is determined by the line space selector. This is set in position 1 for single spacing, in position 2 for intermediate spacing, in position 3 for double spacing, and in position 4 for triple spacing.

With the line space selector in position 0, the spacing mechanism is disengaged and the platen (roller) can be revolved freely by hand to any position. This is used when inserting corrections between lines, or for signs either above or below the writing line, for example: H_2SO_4, $a^8 + b^8$, 23^{RD}, 60^o, etc.

When using position 0 of line space selector ⑨ instead of variable line spacing knob ⑧ the platen will align itself automatically to the lines typed before, after the line space selector ⑨ has been returned from position 0 to the positions 1, 2, 3 or 4, as the case may be.

Variable Line Spacing Knob ⑧

The platen can also be disengaged from the spacing mechanism by pressing this knob. Use this in conjunction with the *line finder* ⑯ when you wish to start typing at a particular position on the paper, when typing on ruled forms, or to find the correct alignment when re-inserting into the machine a sheet that has already been typed.



Personal Touch Tuning ⑤

This device enables the user to adjust the key tension to suit his or her touch. The lever will be found under the *detachable top cover* on the left side. There are four positions, 1 the lightest, 4 the heaviest.

The beginner is recommended to start with the tension set at 4. Later, as ease and lightness of touch and speed have been acquired, the adjustments can be brought into play one after the other until the lightest touch is in use at position 1. Experienced typists who have used heavier machines will find it better to follow this method too.

Carriage Release Levers ⑩

When either of these levers is pressed, the carriage moves freely to the left and may be brought to any desired position.

Bail Rod ⑭

This holds the paper firmly against the platen. It should be

raised when inserting paper into the machine or when making an erasure.

Paper Release Lever ⑰

When pulled forward it loosens the paper under the platen. It is used for adjusting the paper to a vertical position and when inserting several sheets with carbon paper into the machine. The lever should always be in the locked position while typing.

Paper Support ⑬

These are folded down when not in use and are raised to support the paper while typing.

Margin Stops ⑫

The two margin stops can be moved quickly into the desired positions by pressing lightly on them and sliding them to left or right along the graduated scale. Each division on the scale corre-

sponds to one typing space. Before setting margins, move the stops to left and right extremities respectively. Next, move the carriage until the type guide ⑮ coincides with the point at which you want your left margin to be. Then move the left-hand stop to the right as far as it will go. Reverse the process to set the right hand stop.
If you want to type beyond the margin stops in either direction, use the *margin release key* ④ as shown on page 4.

Line Finder ⑯

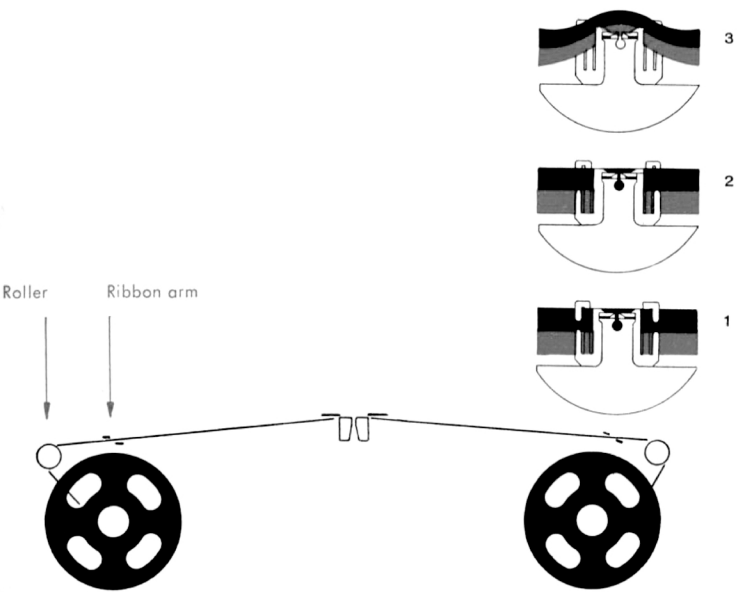
The top edge of the line finder shows exactly the position of the typing line. Thus it serves as a guide when you are writing on lined paper, and when it is necessary to return to a line after the variable line spacing knob ⑧ has been used, or when the paper has been taken out of the machine. The white marks coincide with the vertical centres of the individual letters.
Vertical or horizontal lines can be drawn by inserting a pencil point in one of the corners of the triangular guide, meanwhile revolving the platen for vertical lines, or moving the carriage sideways for horizontal lines.

Paper Guide ⑪

It ensures accurate positioning of the paper on the platen and helps to obtain constantly even page setting.

Bell

The ringing of the bell is a warning that there are only a few more spaces before the end of the writing line.
Obviously the number of spaces varies according to the kind of types.



Ribbon

The ribbon is generally in two colours, the top half being blue or black and the bottom half red. To switch from one to the other use the *ribbon colour lever* ⑲ as indicated on pag. 5. The machine uses a full length ribbon, on standard machine size spools. For best results always use an Olivetti ribbon. In emergency any ½ inch wide ribbon can be used provided there is an eyelet at each end of the spool to activate the ribbon reverse.

Ribbon Reverse

The ribbon moves along automatically each time a key is depressed. When it reaches the end on one spool, it reverses also automatically. To wind the whole ribbon on to one of the spools, e. g., when about to change it, just rotate the appropriate spool with the finger. Before doing so, move the ribbon arm as far as it will go away from the spool towards the centre of the machine.

Changing the Ribbon

Having removed the top cover, wind the whole ribbon on to one spool. Then slide the ribbon out of the hooks of the ribbon vibrator. (See 1, 2 and 3 above). Unscrew the two knurled nuts which hold the spools in place and take out the two spools. Hook the new ribbon to the empty spool and wind it until the metal eyelet — about 6″ from the end — is covered. Replace the spools on their shafts and make sure the two knurled nuts are replaced and tightened, as otherwise the ribbon will not move. Check that the bottom half of the ribbon is in the red position. Reinsert the ribbon into the ribbon vibrator.

Putting the Machine in its Case

First lock the carriage with the carriage locking lever ⑦, fold the *carriage return lever* ⑥ back and down.

The Olivetti Studio 44 requires very little maintenance however heavy the load of work. But naturally it will give of its best if it is treated with the care that every fine machine deserves. Always slip the rubber cover over the machine when it is not in use, to protect it from dust. Then to keep it up to concert pitch, follow these simple rules.

Type Cleaning

As soon as the typing lacks its usual clean appearance, clean the type. Take off the *top cover* ⑱. Now press the keys on the left half of the machine with the open hand and slide a piece of paper under the lifted type bars. The paper will support the type and catch the dirt. Use the nylon brush which is supplied in the cleaning kit, dip it in any good typewriter cleaning fluid and clean each letter. After cleaning, dry the type letters, one by one, and remove the paper carefully. Follow the same procedure with the other half of the keys. Do not allow drops of cleaning fluid or pieces of dirt to fall into the machine or to adhere to the type bars.

Maintenance

Erasing

When erasing with a rubber, move the carriage to one side so that the particles of rubber from the eraser fall clear of the type segment.

Cleaning the Platen

Use a clean white cloth slightly dampened with good rubbing alcohol.

Backing Sheets

When typing single copies it is advisable to have an extra sheet of paper behind the one being typed. This ensures a better impression and reduces the wear on the platen.

Internal Cleaning

For a quick internal cleaning, unscrew the metal plate under the machine, clean the internal parts with the soft hair brush also supplied with the cleaning kit. It should be dry. Never oil the machine. It leaves the factory ready for long service without attention. Special oils are necessary and are applied only to certain points. Indiscriminate oiling can interfere with the proper working of the machine.

Faulty Working

If a fault does develop take the machine to your Olivetti agent or to a good typewriter maintenance firm. As a rule, defects are small and very easily put right by an expert. But damage can be caused by inexperienced hands.

General Maintenance

From time to time you should have the typewriter thoroughly checked. This lengthens its life and keeps it in good working order. For such attention you are advised to go either to an Olivetti agent or to some reliable typewriter maintenance firm.

Ing. C. Olivetti & C., S. p. A.

Head Office and Factory in Ivrea (Italy)

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Technical Service

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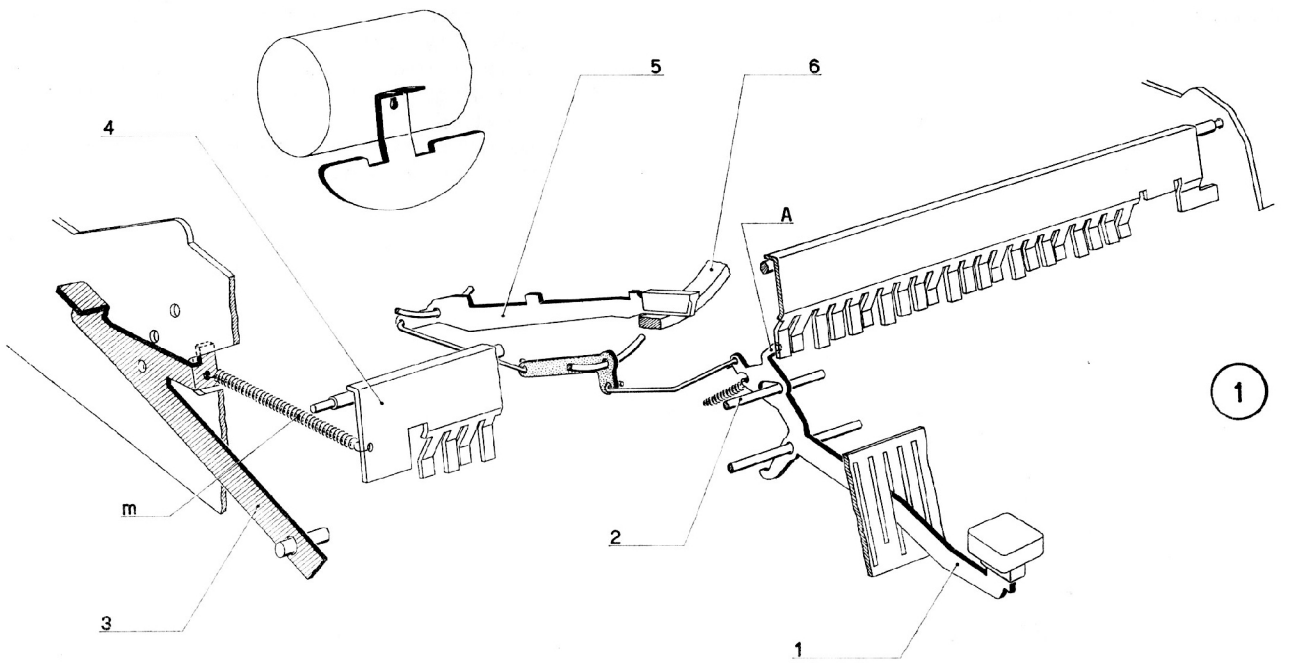
Adjustments: Typing Action and Touch Tuning

We have illustrated in the figure the typing action device at rest. Please note that:

— the key-lever **1** rests on the pivot-wire **2**

— the type-bar **5** rests on the cushion **6.**

When a key is depressed its type-bar strikes the platen. The extension **A** of the key-lever will meet and rotate the ribbon drive plate **4** which functions will be explained latter on. To rotate this plate it is necessary to overcome the action of the spring **m** which, through the lever **3**, can have three different tension values. In this way we shall modify the striking impact necessary to depress a key; the touch will be therefore adjusted to suit the typist.



1 - FIGURE 2

Adjusting the typing action device.

Before actuating the type-bars, the keys must make an idle travel by 1 mm. about.

This condition is obtained by varying the length of the stay **T** thus modifying its curve angle.

2 - FIGURE 2

Adjusting the plane of the ribbon drive plate 19 1 006 L.

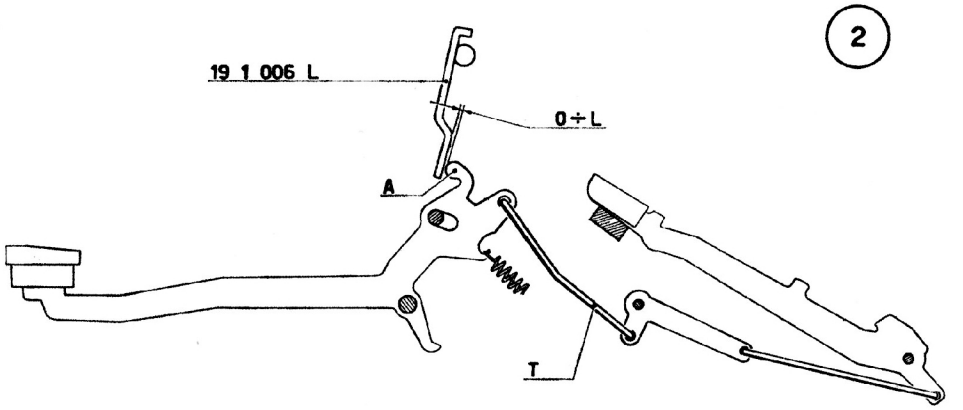
The plate 19 1 006 L must show at rest:

— some of its wings (from right to left) in contact with the extensions **A** of the key-levers

— its other wings next to the extensions **A** of the other key-levers.

In other words, we should have between the extensions **A** and the wings of the plate a very little clearance **L** or no clearance at all.

These conditions are obtained by forming suitably the plate or the single wings of the plate.



Shift Control

The segment can take two positions:

— high position (rest) corresponding to « Small letters »

— low position corresponding to « Capital letters ».

The shift levers must lower the segment moving it to « Capital letters ». The shift-lock lever must hold the segment in « Capital letters » position.

a) The rest position of the segment **15** is that of « Small letters » in which its right support **16** rests — actuated by the two springs **m** — on the head of pivot **17** screwed in the fixed bracket **18.**

In this position there should on the contrary be a little clearance between the left support **12** and the head of pivot **14** screwed in the fixed bracket **13.**

b) When one of the two shift control levers **7** or **20** (which are integral) is depressed, the arm **10** is rotated in the direction of the arrow. This arm rotates through the spring $\mathbf{m}_1$ the two arms **11** and **19** which are integral. The segment will be therefore lowered and stopped whenever its left support **12** meets with the special flexible ring fitted on pivot **14.**

In this position there should be a little clearance between the right support **16** and the special flexible ring fitted on pivot **17.**

c) Once the « Capital letters » position reached, the shift control keys can still be depressed since the extension **K** of the arm **10** can move in the slot of the arm **11** stretching the spring $\mathbf{m}_1$. We shall see hereafter that this super-travel permits « setting » the segment in « Capital letters » position.

d) We can therefore deduce that to hold the segment in « Capital letters » position it is necessary to hold one of the two shift levers down. If these levers are left, the two springs **m** restore the segment to « Small letters » position.

It is anyhow possible to hold the segment in « Capital letters » position through the « shift-lock lever » **8.** This lever is pivoted on the shift control lever **7** and can be hooked to the small plate **9** holding the spring $\mathbf{m}_1$ stretched. By depressing the lever **8** we in fact lower the lever **7** also; consequently:

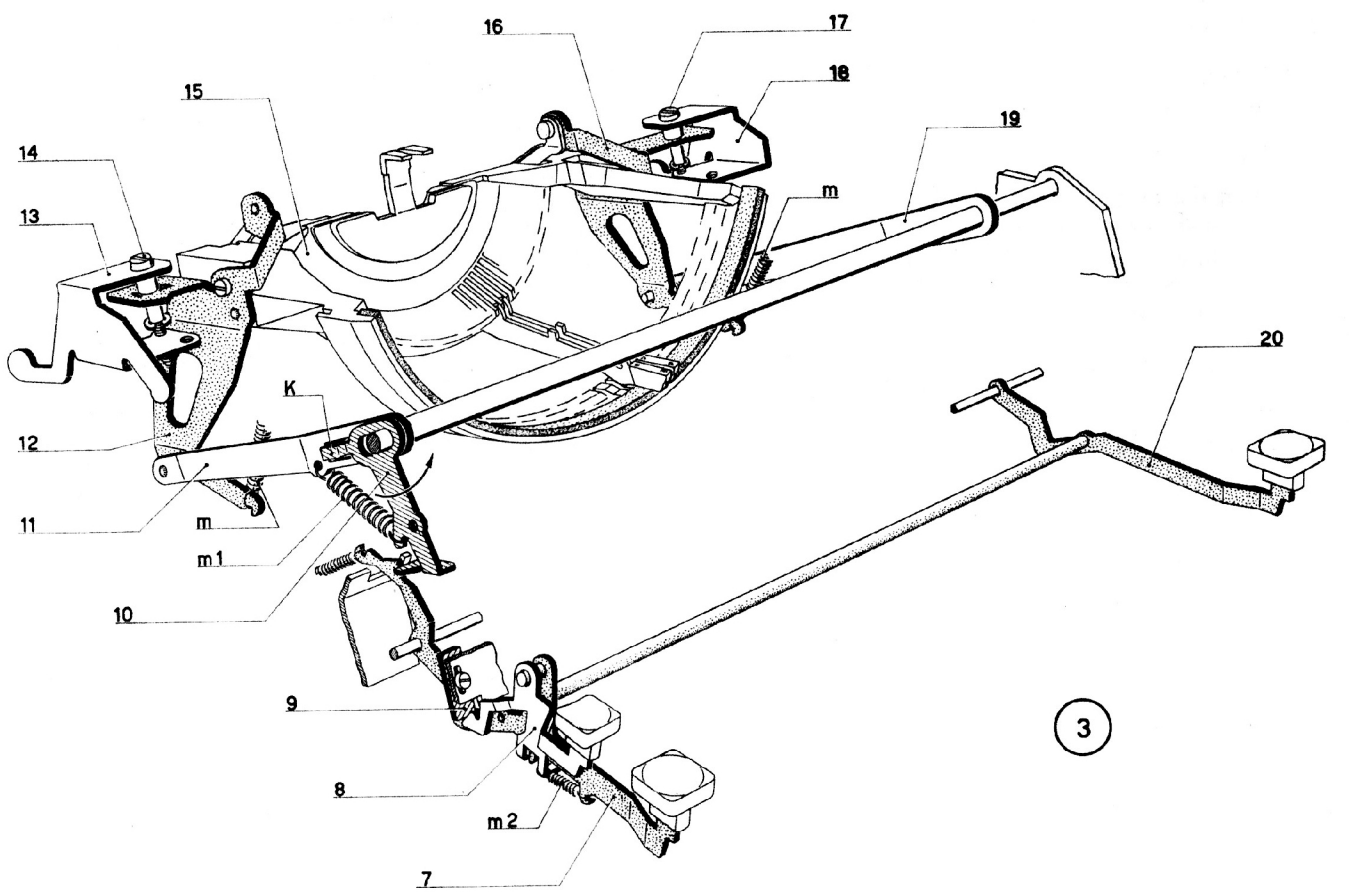
— the segment will move to rest with its left support **12** on the flexible ring fitted on pivot **14**

— in this position it will not be possible hooking the lever **8** to the small plate **9**

— by still depressing the lever **8,** the segment doesn't move any more down. The extension **K** of the arm **10** can move in the slot of the arm **11** stretching the spring $\mathbf{m}_1$,

— it will now be possible hooking the lever **8** to the small plate **9**. The same spring $\mathbf{m}_1$ will hold this engagement.

e) To release the lever **8** from the small plate **9**, lower one of the two shift levers. The spring $\mathbf{m}_2$ will restore the lever **8** which will leave the small plate. By letting go the lever the shift lever will move back to rest.



The adjustments concerning the shift control now explained should be performed after having checked the stopping of the type-bars against the segment and the platen.

In this way the platen will be « straightlined » with the type-faces.

1 - FIGURES 4 - 5 - 6

Adjusting the tangent plane and the alignment between small letters and capital letters.

The type-face must strike the platen and print evenly: the letter must be well printed up and down. In this way the center of the type-face will be in the printing axle **a-a** (figure 4).

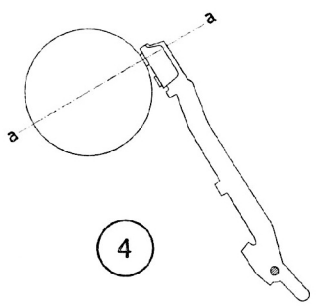
If the tangent plane test is done with Capital letters, it will be therefore necessary to align these latters with Small letters.

On the Lettera 32 the vertical position of the segment with respect to Capital letters is adjusted by means of the left pivot; the right pivot is used to align the Small letters with respect to the Capitals.

a) Move the segment to Capital letters position.

b) Strike slightly some keys. The printing of the type-faces must be even up and down. This condition should be obtained by adjusting the position of the left pivot 19 0 363 G; this pivot determines by means of its flexible ring **A** the « Capital letters » position of the segment (figure 5).
In this condition there must be a little clearance **L** (figure 5) between the ring $\mathbf{A}_1$ and the right support of the segment.

c) To align the Small letters to the Capital letters, adjust the vertical position of the right pivot 19 0 363 G which by means of its head determines the « Small letters » position of the segment (figure 6). In « Small letters » position there must be a little clearance **L** between the pivot and the left support (figure 6).



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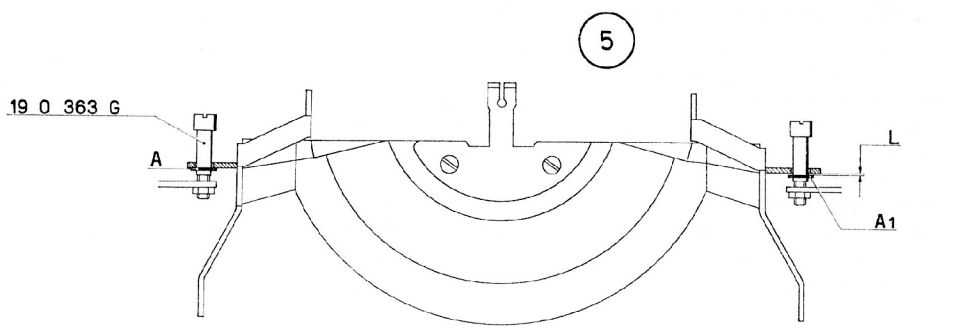

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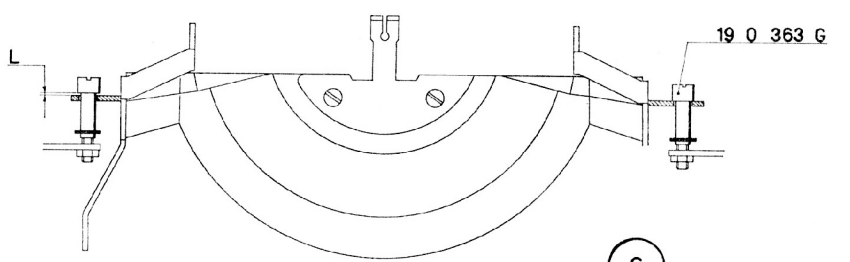


6

2 - FIGURES 7 and 8

Adjusting the hooking of the shift-lock lever.

We have already said that it is possible « holding » the segment in « Capital letters » position by hooking the « shift-lock lever » to an appropriate small plate.

Please note that this adjustment can be done only after the Capital letters position of the segment has been adjusted (see paragraph 1).

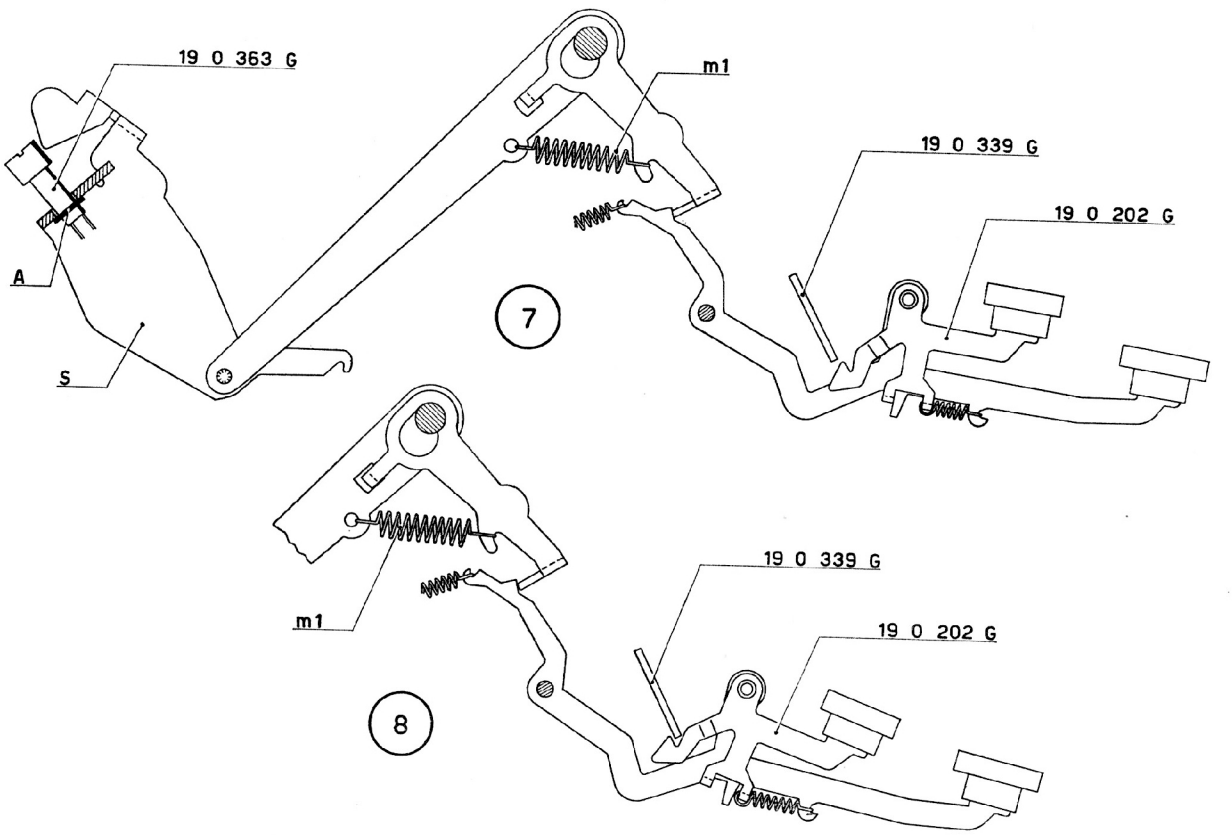
a) Depress one of the shift control levers until the segment reaches « Capital letters » position, that is until the left support **S** meets with ring **A** fitted on the pivot 19 0 363 G (figure 7).

In these conditions it must not be possible hooking the shift-lock lever 19 0 202 G to the small plate 19 0 339 G.

b) Depress still further one of the shift control levers to stretch the spring $\mathbf{m}_1$ (see figure 8).
Now it must be possible to hook the lever 19 0 202 G to the small plate 19 0 339 G.

c) With the lever 19 0 202 G hooked to the small plate depress one of the two shift control levers; the lever 19 0 202 G must get released.

d) These above conditions are obtained by adjusting the vertical position of the small plate 19 0 339 G.



Ribbon Advance, Reverse and Bichrome

Each time a key is typed and the proper type-bar strikes the platen it is necessary that the ribbon advances by a certain quantity. Only like this we shall obtain an even printing.

When on one of the two spools is nearly empty, it is necessary to reverse the movement of the ribbon.

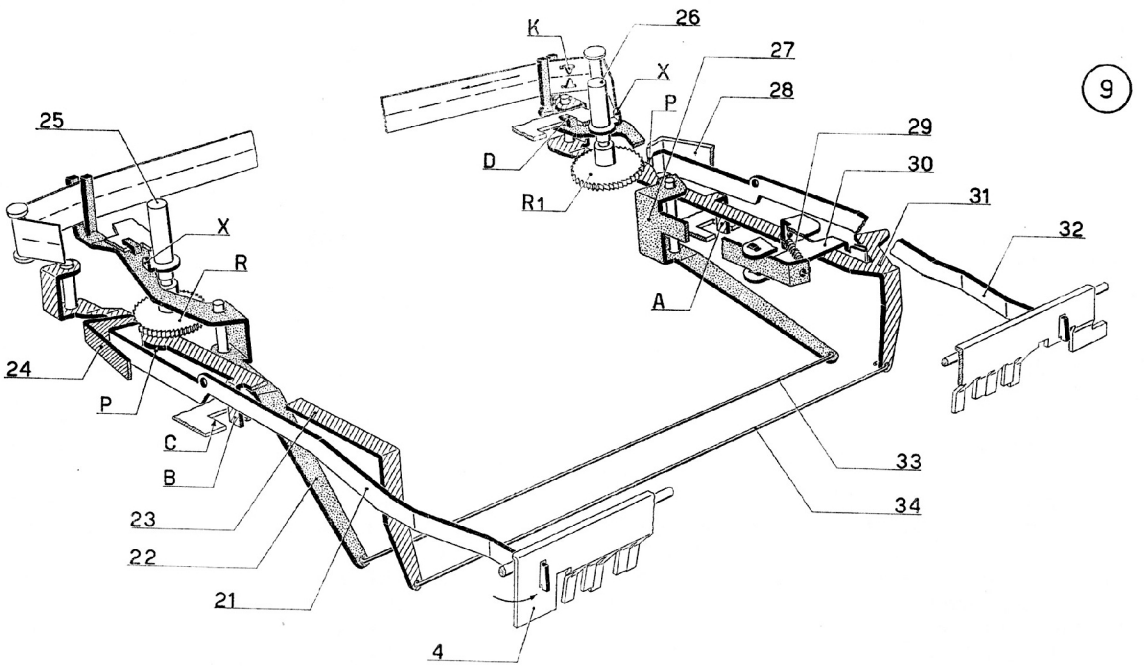
a) The two ribbon spools fitted on the shafts **25** and **26** (see figure 10) are integral with them since the extension **X** is inserted in one of their holes.
The arm **35** (figure 10) rests against the brackets **S**. The ribbon advance toothed wheels **R** and $\mathbf{R}_1$ are also integral with the shafts **25** and **26**.

b) The ribbon is located in the forks of the two plates **22** and **27** connected through the pivot-wire **33**.

c) On the right plate **27** is pivoted the pawl **30** which controls the lever **31** and consequently the lever **23** through the pivot-wire **34**.
Actuated by the spring **29** of the pawl **30**:
— the plate **27** rests through its wing **D** against the right spool support and stabilises in this way the plate **22** also
— the lever **31** rests through its wing **A** against the right spool support and stabilises in this way the lever **23** also.
In the conditions illustrated in the figure, the ribbon is winding on the left spool. In these conditions:
— the profile **P** of the lever **23** permits the stay **21** to engage with the teeth of the wheel **R**
— the profile **P** of the lever **31** holds the stay **32** away from the teeth of the wheel $\mathbf{R}_1$.
The two stays **21** and **32** are connected to the ribbon drive plate **4**; consequently each time a type-bar strikes the platen they move forward.
The travel of the stay **21** is active and causes a short rotation of the wheel **R**, of the shaft **25** and of the spool fitted on it. The travel of the stay **32** is idle.

d) The profiles **P** of the two levers **23** and **31** check also the stabilisers **24** and **28** (in the figure 11 is illustrated the part of the stabiliser **24**).
The stabiliser will be necessarily engaged with the wheel when its proper stay is active.

e) When on the right spool the ribbon is almost exhausted the hook **K** fitted on it rotates the plate **27.** This latter moves the pawl **30** which will go working on the second inclined plane of the lever **31**. The plate **27** will move to rest through its wing **D** against the opposite stop of the right spool support and will continue to hold the plate **22** also.
The lever **23** will move to rest through its wing **B** against the profile **C** of the left support and will therefore stabilises the right lever.
In these conditions:
— the lever **23** will remove the stay **21** and the stabilizer **24** from the wheel **R**
— the lever **31** will permit the stay **32** and the stabiliser **28** to engage with the teeth of the wheel $\mathbf{R}_1$.
The stay **32** will be therefore active and the ribbon advance reversed.



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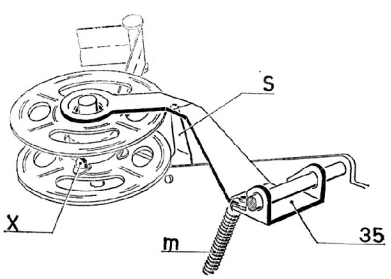

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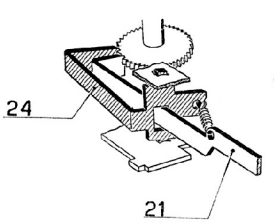


11

In connection with the type-guide there is the ribbon placed in the appropriate ribbon vibrator.

At rest, the ribbon is not on the trajectory of the type-bars but lower. It will be therefore necessary to raise it so that it can move between the type-face and the platen each time a type-face is being printed.

It is generally a bicolour ribbon (black-red). The ribbon lifting should consequently have different values according to the colour wished. The possibility of obtaining different liftings is given by the bicolour attachment which permits to use the ribbon throughout when a single colour ribbon is involved.

At last if we wish the type-face striking the platen without the ribbon moving between them (for instance when typing stencils) it will be necessary to leave the ribbon at rest (neutral position).

a) In the figure the bicolour control lever **36** is in neutral position. Consequently, it holds through the connecting-rod **38** the small bridge **40** so that its extension **A** is under the wing **B** of the bridge **42**.

b) When the ribbon drive plate **4** rotates in the direction of the arrow it moves the stay **37** forward; this latter will rotate the small connecting-rod **39**. Thanks to the spring **m** this connecting-rod will try to rotate the bridge **42** which with its wing **B** will immediately move to stop against the extension **A** of the small bridge **40**. Since the bridge **42** doesn't rotate it will leave the ribbon vibrator **43** at rest while the rotation of the small connecting-rod **39** will take place in the opening of the bridge **42** thus stretching the spring **m**.

c) By moving the bicolour control lever **36** to high position (black) the connecting-rod **38** will rotate the small bridge **40** which:

- will move its extension **A** out the interference of the wing **B** of the bridge **42**
- will move its wing **D** to interfere with the trajectory of the extension **E** of the ribbon vibrator **43.**

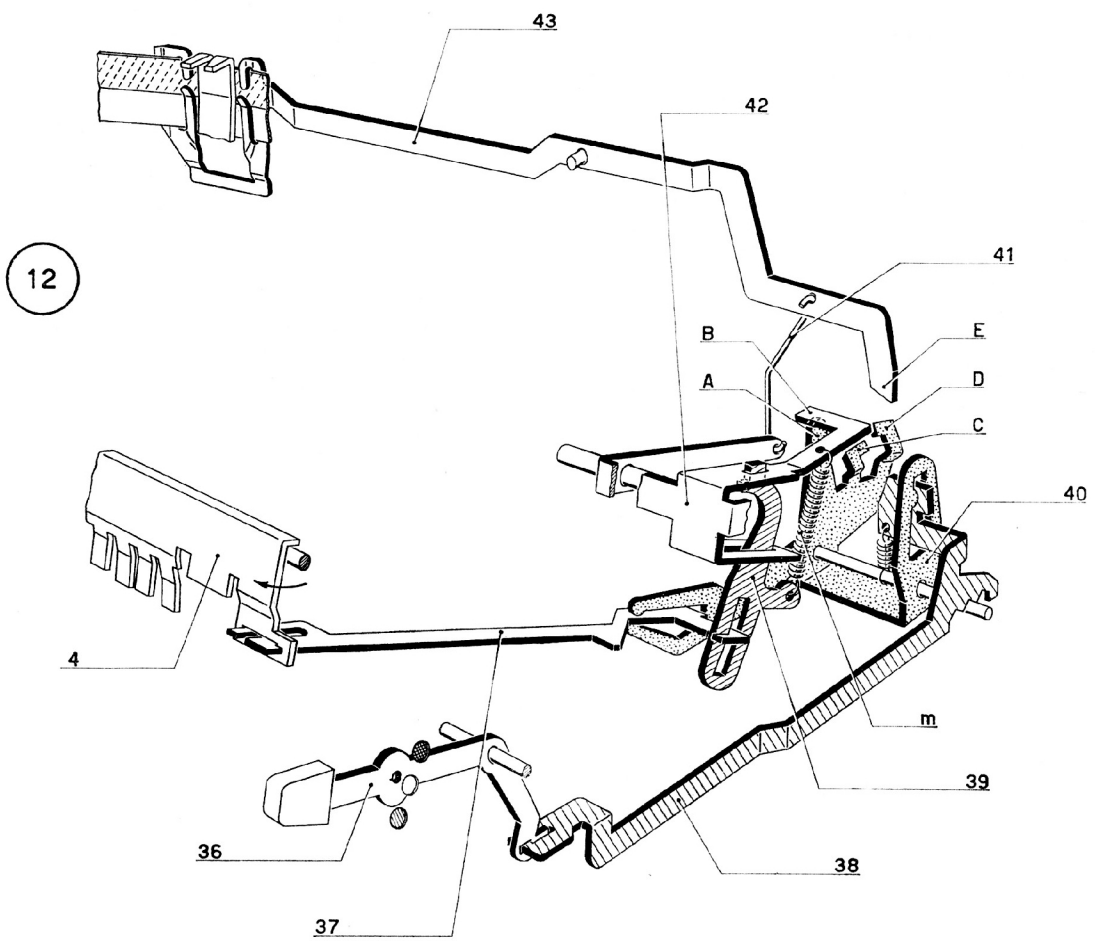
When the ribbon drive plate **4** rotates in the direction of the arrow it moves the stay **37** forward; this latter will rotate the small connecting-rod **39**. Thanks to the spring **m**, this connecting-rod will rotate the bridge **42** which will raise by means of the stay **41** the ribbon vibrator **44** which will move to stop with its extension **E** against the wing **D** of the small bridge **40.**

The ribbon vibrator will move the ribbon to « black » position.

d) By moving the bicolour control lever **36** to low position (red) the connecting-rod **38** will rotate the small bridge **40** which:

- will move its extension **A** out the interference of the wing **B** of the bridge **42**
- will move its wing **C** to interfere the trajectory of the extension **E** of the ribbon vibrator **43**.

This time the ribbon vibrator can make a longer rotation (red).



1 - FIGURES 13 - 14 - 15 and 16

Adjusting the ribbon advance and reverse.

a) Move the right plate 19 0 709 L to the position illustrated in the figure 13. In such position the ribbon must be winding on the left spool.
In these conditions check that this plate rests through its wing **A** on the proper stop; the left plate 19 0 678 L must present its wing **B** away of the proper stop (figure 13). The position of the two plates is therefore established by the wing **A**. Please note that the slot in which is placed the wing **A** is narrower than that in which is placed the wing **B**.

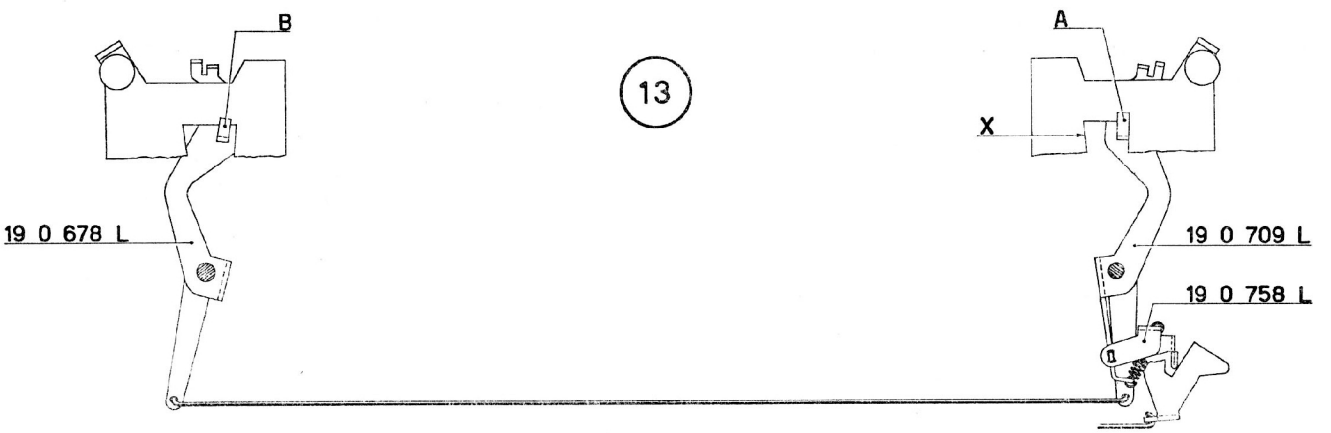
b) Rotate the right plate to reverse the ribbon advance. Even in this position the wing **A** must always establish the position of the two plates by resting against the stop **X**. The wing **B** of the left plate must be away from its stop.

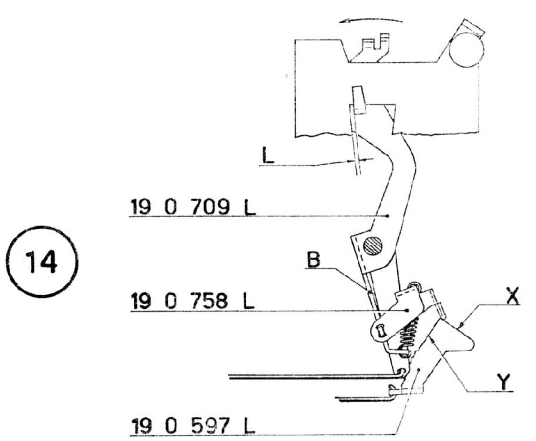
c) The conditions described at points *a*) and *b*) are obtained by forming suitably the left plate 19 0 678 L.

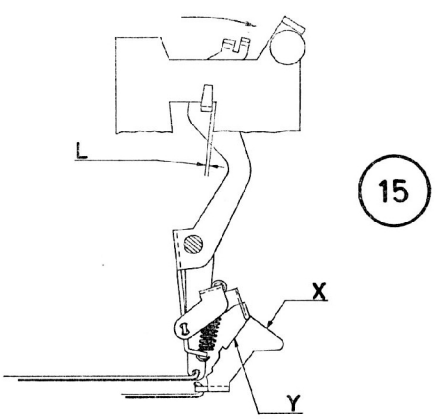
d) Rotate slowly by hand the right plate 19 0 709 L in the direction of the arrow (figure 14). The pawl 19 0 758 L with respect to the 19 0 597 L:
— slides at the beginning on the inclined plane **Y**
— moves to its top
— moves to the inclined plane **X** (figure 14) to control the reverse.
In these conditions we should have the clearance **L** shown in the figure 14.

e) Rotate slowly by hand the right plate 19 0 709 L in the direction of the arrow (figure 15). The movements described at point *d*) should Rappen in the opposite direction. Here also we should obtain the clearance **L**.

f) The clearance **L** shown in the figures 14 and 15 must be equal. The condition is obtained by forming suitably the arm **B** of the plate 19 0 709 L (figure 14) supporting the pawl 19 0 758 L.





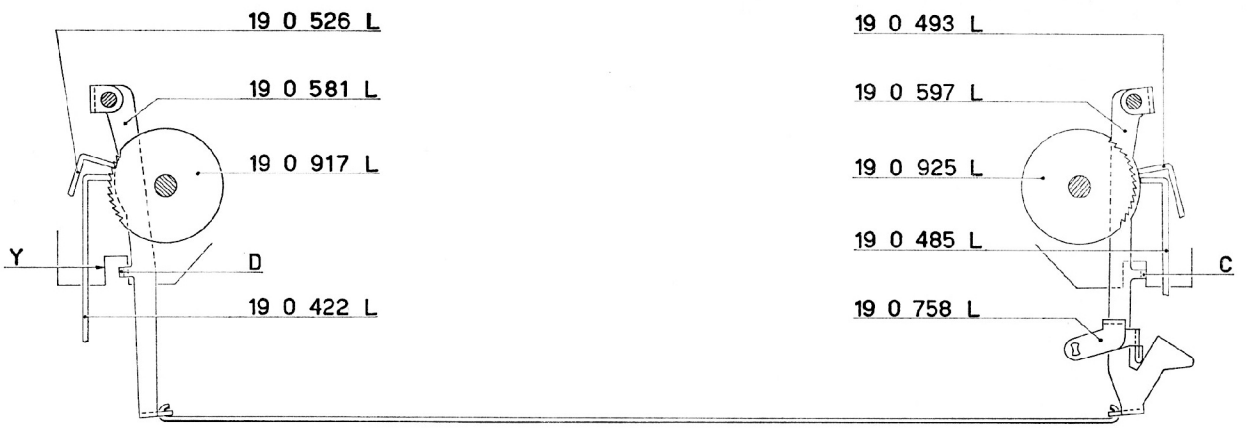


g) Move to the condition illustrated in the figure 16 in which the pawl 19 0 758 L must stabilise:
- — the left lever 19 0 581 L so that the hook 19 0 422 L and the stabiliser 19 0 526 L are engaged with the toothed wheel 19 0 917 L
- — the right lever 19 0 597 L so that the hook 19 0 485 L and the stabiliser 19 0 493 L is away from the toothed way 19 0 925 L.

This is obtained by forming suitably the wing **C** of the right lever 19 0 597 L which rests against its proper stop. The wing **D** of the left lever 19 0 581 L must on the contrary be away from its proper stop.

h) Reverse the ribbon movement. The conditions described at point *g*) must be reversed.
This will be obtained by forming this time the wing **D** of the left lever 19 0 581 L which will move to rest against the proper stop **Y**.

16



The adjustments of the bicolour attachment we are explaining hereafter must be performed naturally after having adjusted the tangent plane and the alignment Small letters/Capital letters.

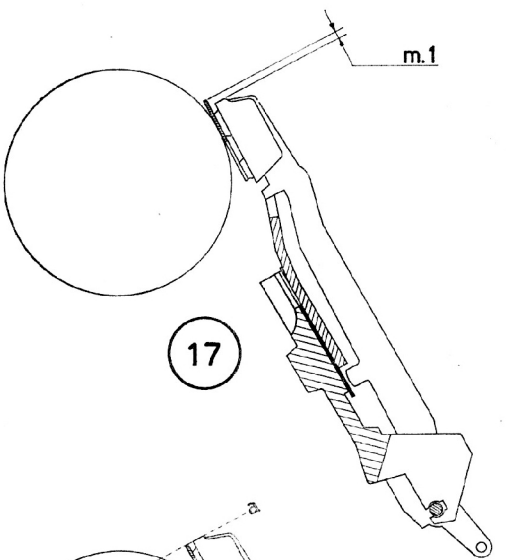
2 - FIGURES 17 - 18 and 19

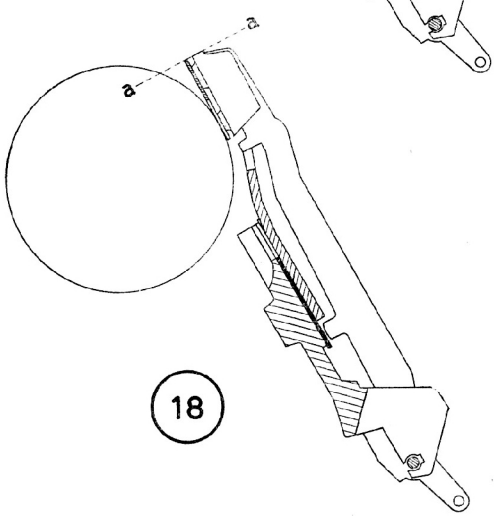
Adjusting the bicolour (black and red printing).

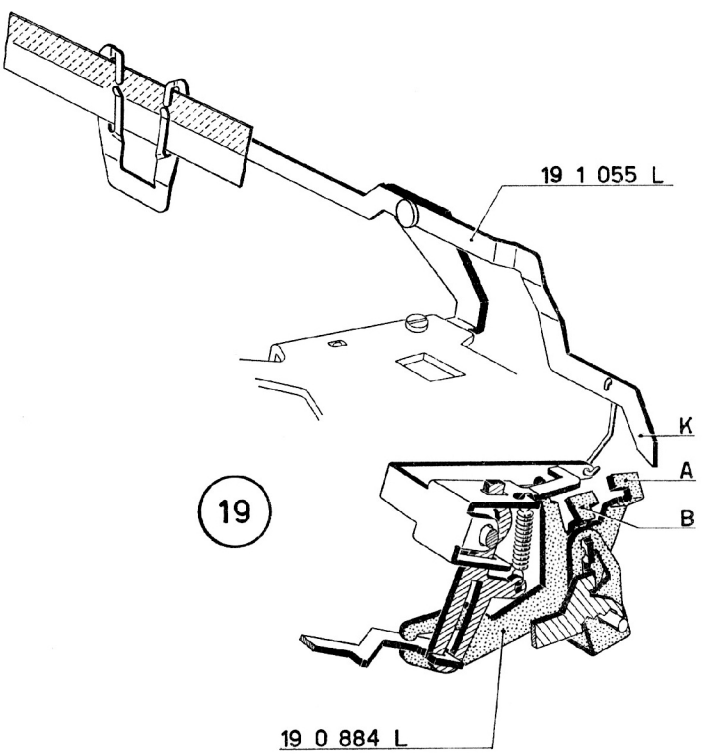
According to the printing desired (black or red) it is necessary that the proper part of ribbon moves between the type-face and the platen.

a) Move the bicolour control lever to « black » position. Move the segment to Capital letters position. Raise some type-bars and check that their type-faces are 1 mm. higher than the ribbon (figure 17). This condition is obtained by forming suitably the wing **A** of the stabiliser 19 0 884 L on which stops the extension **K** of the ribbon vibrator 19 1 055 L.

b) Move the bicolour control lever to « red » position. Move the segment to small letters position. Raise some type-bars and check that their type-faces are straight-lined with the ribbon (line **a-a** - figure 18). This condition is obtained by forming suitably the wing **B** of the stabiliser 19 0 884 L on which stops the extension **K** of the ribbon vibrator 19 1 055 L.







Carriage and Margins

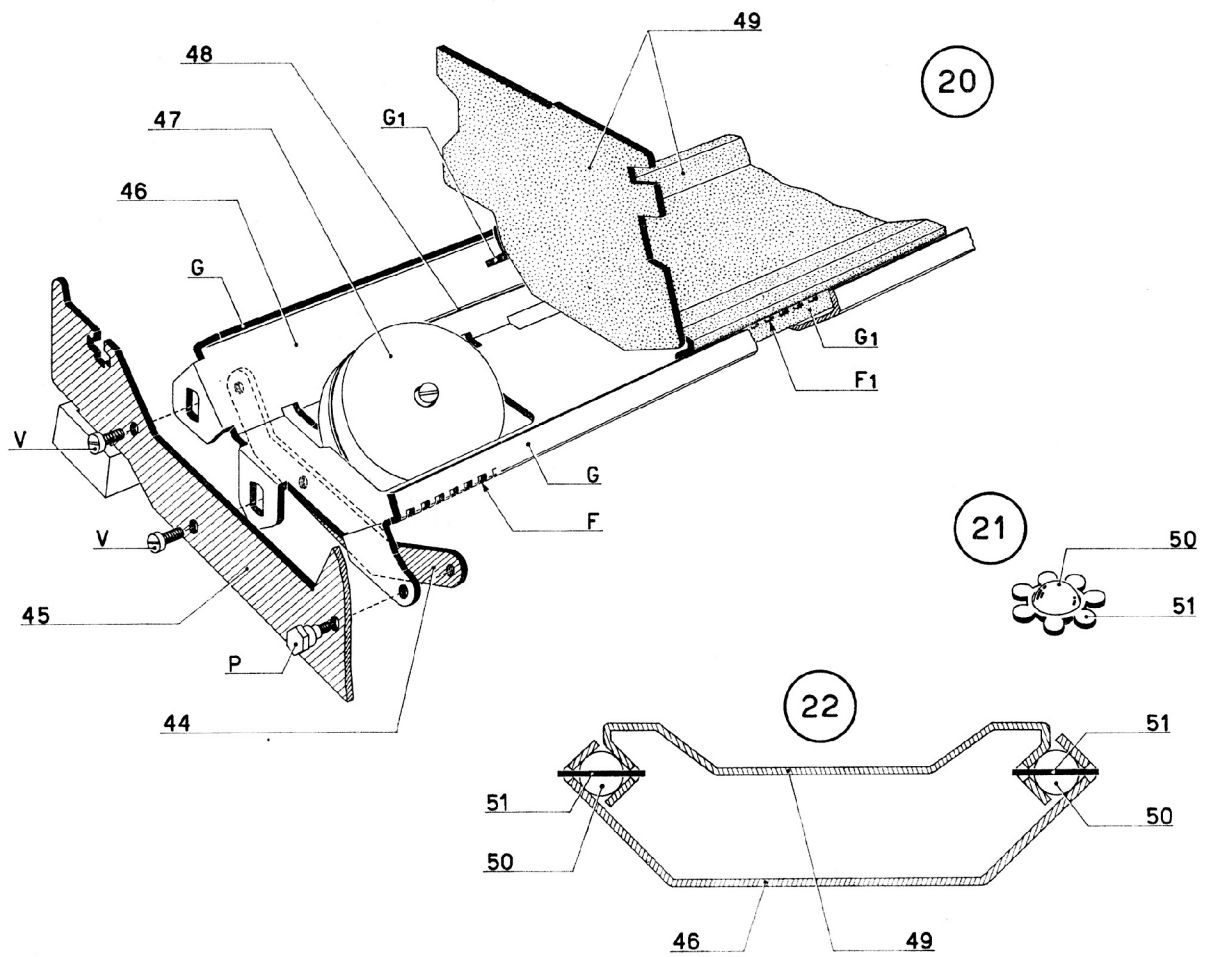
a) The carriage includes:
— the fixed guide **46**
— the movable guide **49**.

b) The fixed **46** includes two V shaped guides (**G**) which have a series of slots **F** on the top.
It is secured on the two side-plates of the machine by means of the small plate **44**. In the figure 20 we have illustrated the left side-plate **45** only. The position of the fixed guide is adjustable; it may rotate around the pivot **P** thanks to the two slots made in connection with the screws **V**.
It will be therefore possible to adjust the position of the carriage with respect to the machine so that the platen is correctly located with respect to the type-bars.

c) The movable guide **49** is secured by two side-plates (in the figure 20, only the left one is visible) and by a plate also supplied with two V shaped guides ($\mathbf{G_1}$). Even in these latters there is a series of slots $\mathbf{F_1}$.

d) The V shaped guides of the fixed guide **46** and of the movable guide **49** are placed one in front another as illustrated in the figure 22.
Between them there are four balls **50** and four toothed washers **51** (figure 21) (two forward and two rearward).
In the figure 22 we have shown the position taken by the balls and the washers. Please note that:
— the balls **50** are resting against the four sides of the V shaped guide
— the teeth of the washers **51** are placed in the slots made in the guides.
We obtain in this way the coupling between fixed guide and movable guide.

e) Please note that the movable guide **49** is constantly dragged toward the left by the spring **47** through the string **48.**
We shall see latter on how this spring works (escapement).



1 - FIGURES 23 - 24 and 25

Adjusting the coupling between the movable guide and the fixed guide. Adjusting the stopping of the type-bars against the platen and the segment.

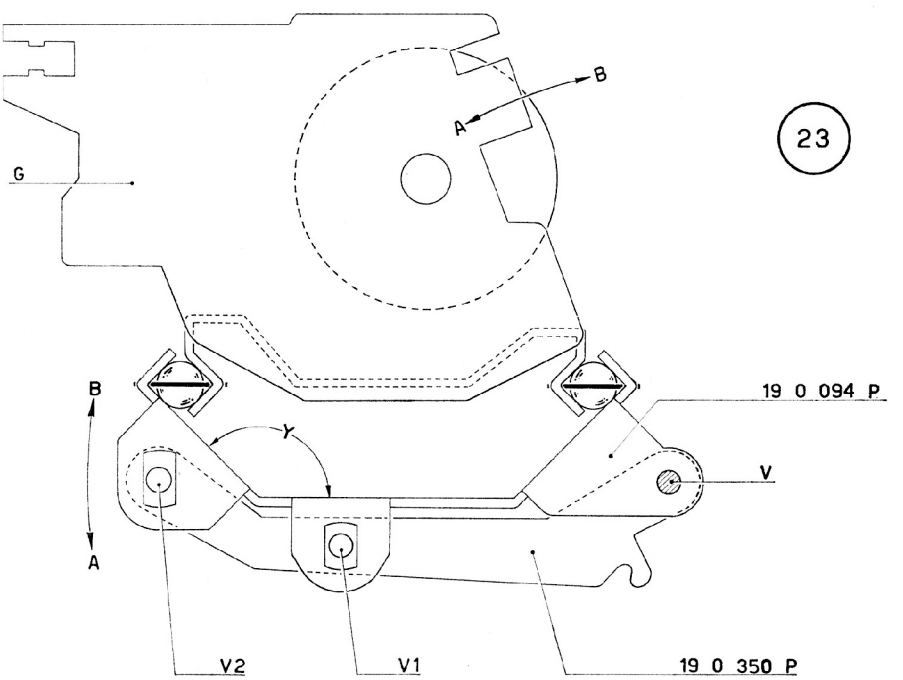
The adjustment of the coupling between movable and fixed guides (see point *a*) and that concerning the stopping of the type-bars against the segment and the platen (see point *b*) must be done at the same time.

For better understanding such adjustments are described separately.

a) The movable guide must slide freely and without play with respect to the fixed guide. To obtain it, it is necessary varying the angle **Y** of the fixed guide so that the V shaped guides are correctly distanced.
To vary this angle it is necessary on both sides of the carriage:
— to tighten the screws **V** and $\mathbf{V}_1$
— to loosen the screw $\mathbf{V}_2$
— to loosen the two screws with nuts securing the fixed guide in central position (these screws are not visible in the figure 23)
— to vary suitably the angle **Y**
— to tighten the screw $\mathbf{V}_2$ and the central screws with nuts.

b) The whole carriage (fixed guide and movable guide) must also be adjusted so that it is correctly located with respect to the segment. The adjustment of this position is done by checking the « stopping » of the type-bars against the segment and the platen as usually (see next page).
The required conditions will be obtained by moving the whole carriage auround the screw **V**. To do this, loosen the screws $\mathbf{V}_1$ and $\mathbf{V}_2$.

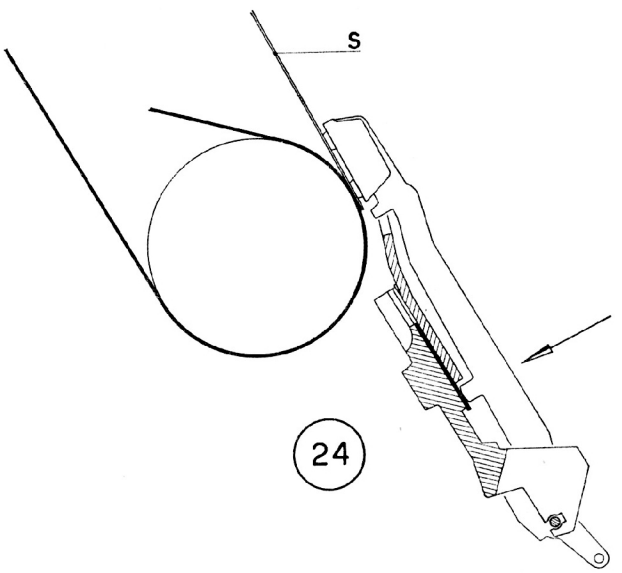
c) It is therefore obvious that we must obtain the conditions described at point *a*) and *b*) at the same time and gradually because by obtaining one condition only we may compromise the other and vice versa.
It will be necessary:
— to adjust the stoppings
— to adjust the coupling of the movable guide with the fixed one
— to check again the adjustment of the stoppings
— etc.
until the two conditions are correctly obtained.

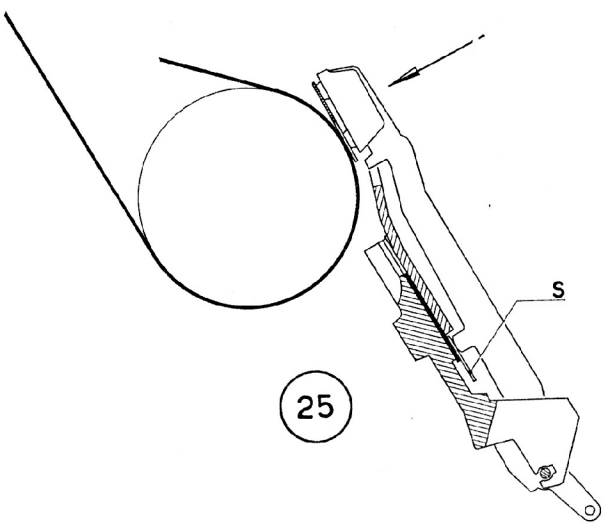


d) The stopping of the type-bars against the segment and the platen must be tested as follows:

	against the platen	against the segment
1 sheet of paper on the platen (0.08 mm. thick)	jes	jes
ribbon	no	jes
paper gauge (0.08 mm. thick)	jes	jes

While testing the stopping against the platen (figure 24) press lightly the type-bar on the segment in connection with the stop tenon.
While testing the stopping against the segment (figure 25) press lightly the type-bar against the platen.
The paper gauge **S** must be evenly held by the segment and by the platen.
If the stopping is insufficient against the segment it will be necessary to move the platen rearward. Rotate therefore the carriage in the direction of the arrows **A** (figure 23).
If the stopping is insufficient against the platen move on the contrary the carriage in the direction of the arrows **B** (figure 23).





Escapement

Each time a key is depressed to print a letter or the space-bar is depressed, the movable guide must advance by one step.

This function is performed by the escapement.

a) The rocking plate **52** is fitted on an appropriate shaft and cannot move laterally. Dragged by the spring **m** (see figure 27) it rests on the lower head of pivot **P**.

b) On the rocking plate **52** is fitted the movable dog **53** which is engaged with a tooth of the escapement wheel **54**. This latter is engaged with the rack **55** set on the movable guide of the carriage.

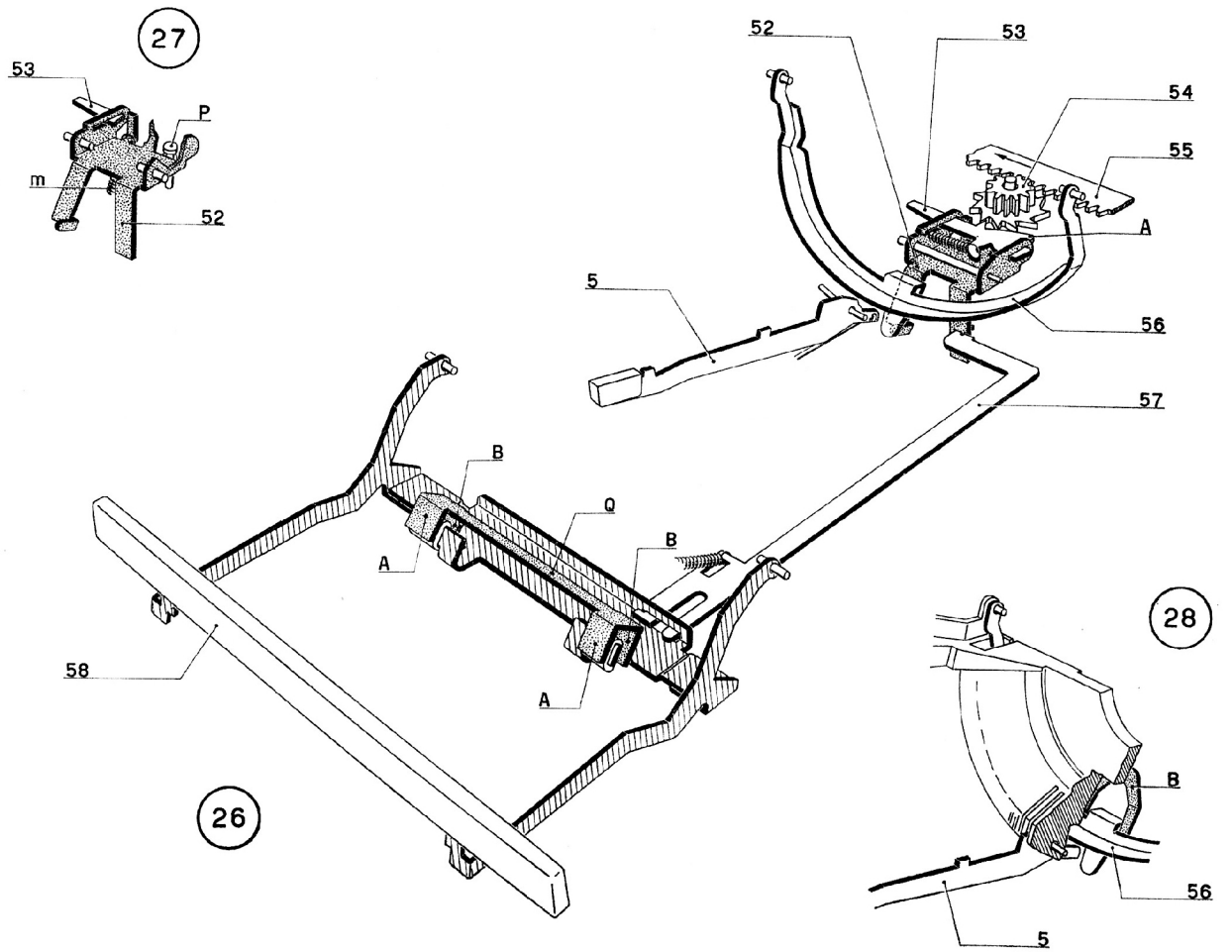
We have said that the movable guide is always actuated leftward by the carriage drawing spring. This action is transmitted from the rack **55** to the wheel **54** and therefore to the movable dog **53** which rests with its extension **A** on the right side of the rocking plate **52**.

c) The rocking plate **52** is checked:

— through the small universal frame **56** by the type-bars **5**. In the figure **28** we have also illustrated the leaf-spring **B** which actuates the universal frame

— through the rod **57** by the space-bar **58**.

In the next page we shall examine the movements obtained by moving the movable guide step by step.

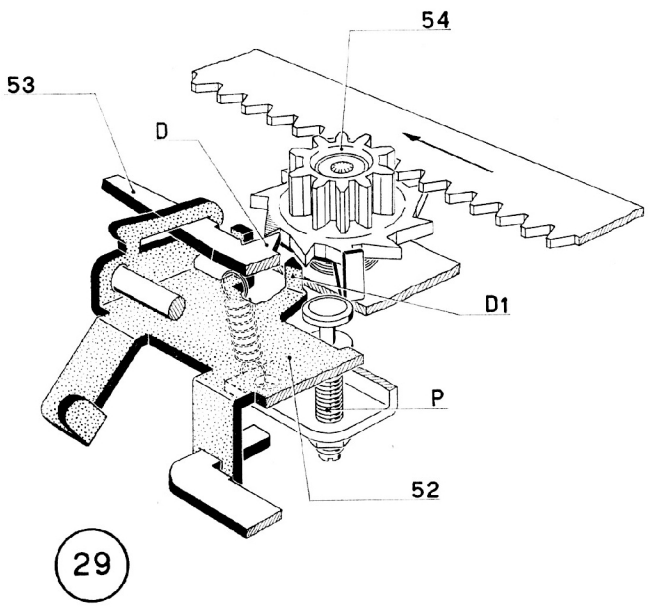


d) In the figure 29 the rocking plate **52** is at rest and consequently in contact with the lower head of pivot **P.** In these conditions:
- — the small tooth $\mathbf{D_1}$ of the rocking plate **52** is slightly lower than the teeth of the escapement wheel **54**
- — the movable dog **53**, through its small tooth **D**, is engaged with the hachured tooth of the escapement wheel **54**. Actuated by the carriage spring the movable dog **53** rests as said against the right side of the rocking plate **52**.

e) By depressing a key which raises its type-bar or by depressing the space-bar, the rocking plate **52** is rotated in the direction of the arrow (figure 30).
While the small tooth **D** of the movable dog moves away from the hachured tooth of the escapement wheel, the small tooth $\mathbf{D_1}$ of the rocking plate interferes the trajectory of the same hachured tooth.
Actuated by the carriage spring, the movable guide does consequently the « first part » of one step advance.

f) When the type-bar moves back to rest or when the space-bar moves back to rest, the rocking plate will be able to move also back to the position illustrated in the figure 29. The small tooth **D** of the movable dog will engage therefore with the tooth of the wheel **54** next to the hachured one. The movable guide will therefore perform the « second part » of one step advance.

g) As we have already seen the one step advance of the movable guide happens in two times. The printing is not performed as we should think between the first and the second trip but before the first. The type-bar moves at a great speed and controls the small universal frame when near the platen. Before the carriage starts moving the type-bar has already performed the printing.
This system grants a more constant spacing and printing speed.



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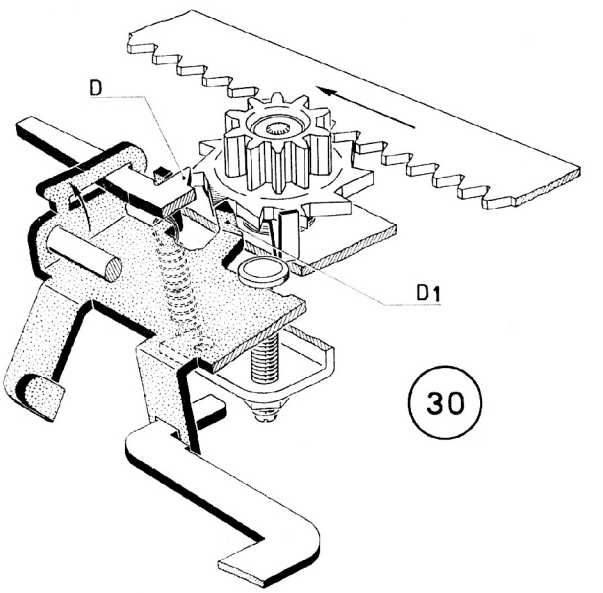


30

Noiseless finger.

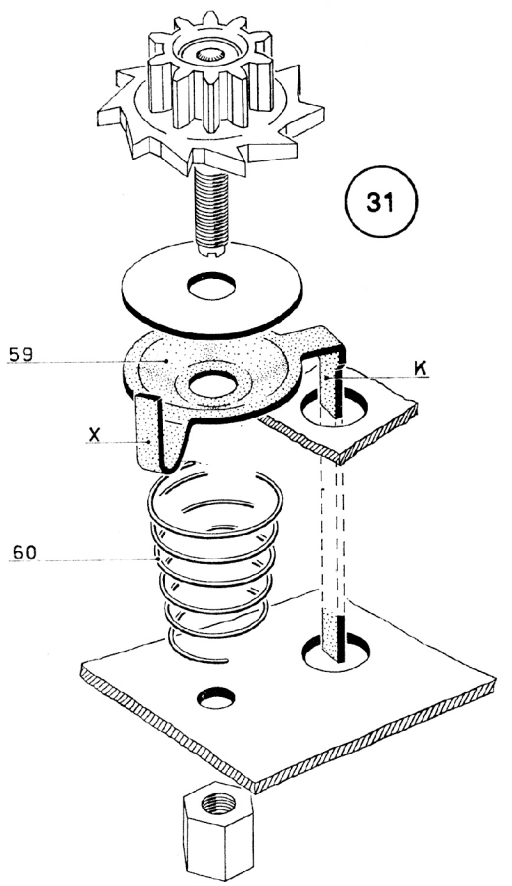
At the end of the writing line it is necessary:
— moving the carriage back to the right
— line-spacing the platen
by actuating the appropriate lever.

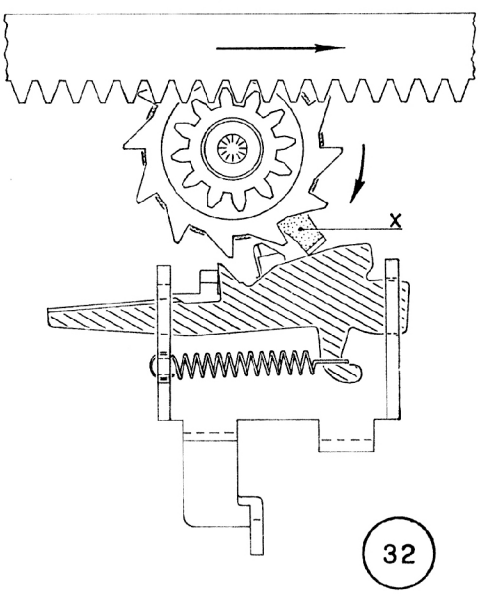
When the carriage moves back to the right the movable dog should rebound on the top of the teeth of the escapement wheel thus producing a disagreeable metallic noise.

A special finger prevents it.

a) We have fitted under the escapement wheel a paper disc and therefore the noiseless finger **59** which is pushed upward by the spring **60** (figure 31).
The extension **K** of the finger is inserted in an appropriate hole thus permitting an angular movement of the finger.

b) When the carriage moves back the rack moves in the direction of the arrow (figure 32) by rotating the escapement wheel.
The finger follows the rotation; consequently, its extension **X** removes the movable dog from the wheel.
The noise is therefore suppressed.





1 - FIGURES 33 and 34

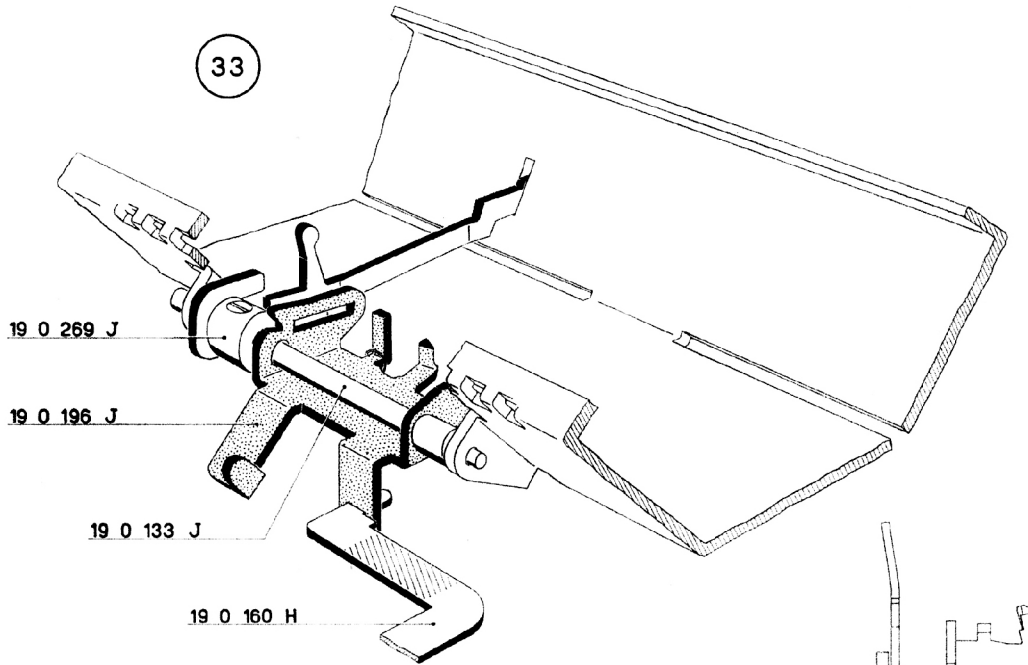
Adjusting the lateral position of the rocking plate.

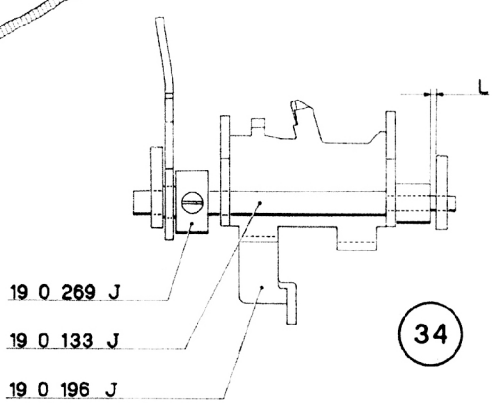
Adjust:

— the position of pivot 19 0 133 J

— the position of the collar 19 0 269 J

to leave a very little axial play (clearance **L** - figure 34) to the rocking plate 19 0 196 J.





2 - FIGURE 35

Adjusting the angular rest position of the rocking plate.

Adjust the vertical position of pivot 19 0 097 J to obtain the clearance of 0.2 mm. between the small tooth **D** of the rocking plate 19 0 196 J and the lower face of the escapement wheel.

3 - FIGURE 35

Adjusting the engagement of the rack with the escapement wheel.

By moving the rack to and fro (with respect to the movable guide) see that it engages fully (with minimum play) with the escapement wheel.

These conditions must be naturally checked all along the rack.

4 - Adjusting the uniformity of the trips controlled by the type-bars.

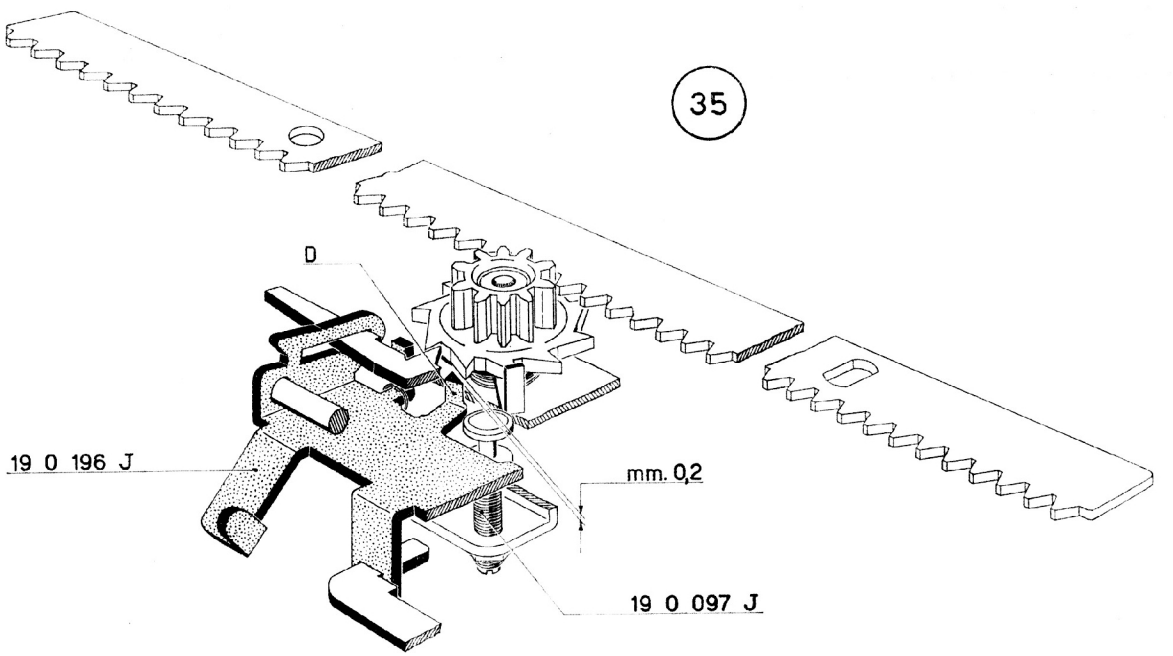
The first trip of the rocking plate must happen when the outer face of the type is at a certain distance from the platen. Before establishing this distance it is necessary checking that the different type-bars (lateral and central ones) control this trip when the types are at the same distance from the platen.

The condition is obtained by forming suitably the two arms supporting the universal frame, that is by « levelling » the small frame with respect to the segment.

5 - Adjusting the uniformity of the trips between Capital letters and Small letters.

With the segment in « Capital letters » and in « Small letters » position the first trip of the rocking plate must happen when the type-bar is at the same distance from the platen.

The condition is obtained by forming suitably the rear wing of the small universal frame actuating the rocking plate.



6 - FIGURE 36

Adjusting the trip controlled by the type-bar.

This trip must happen when the type-face is at 2 ÷ 6 mm. from the platen (figure 36).

This condition is obtained by forming suitably the wing of the rocking plate on which works the small universal frame.

7 - Adjusting the trip controlled by the space-bar.

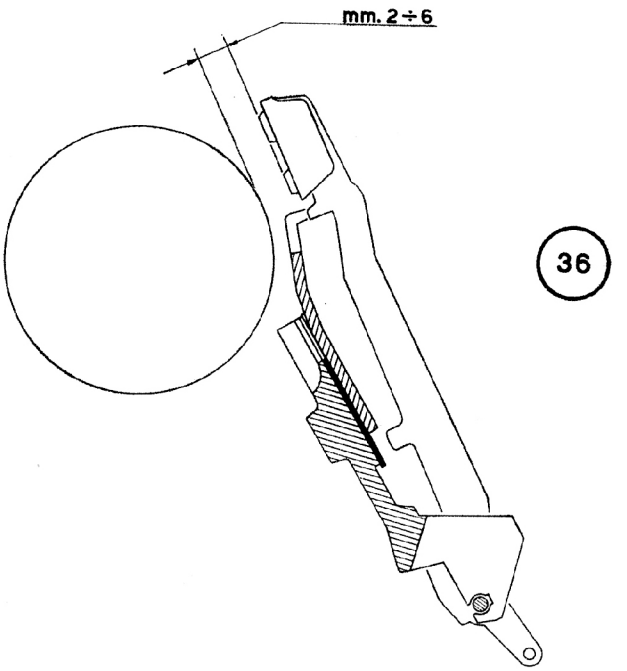
a) Depress slowly the space-bar and check that:

— it makes an idle travel
— it controls the first trip of the escapement
— it makes still an idle travel.

b) Let it move back to rest and check that:

— it makes an idle travel
— it controls the second trip of the escapement
— it makes still an idle travel.

b) We obtain the desired conditions by forming on the wings **A** and **B** of the plate **Q** (figure 26).



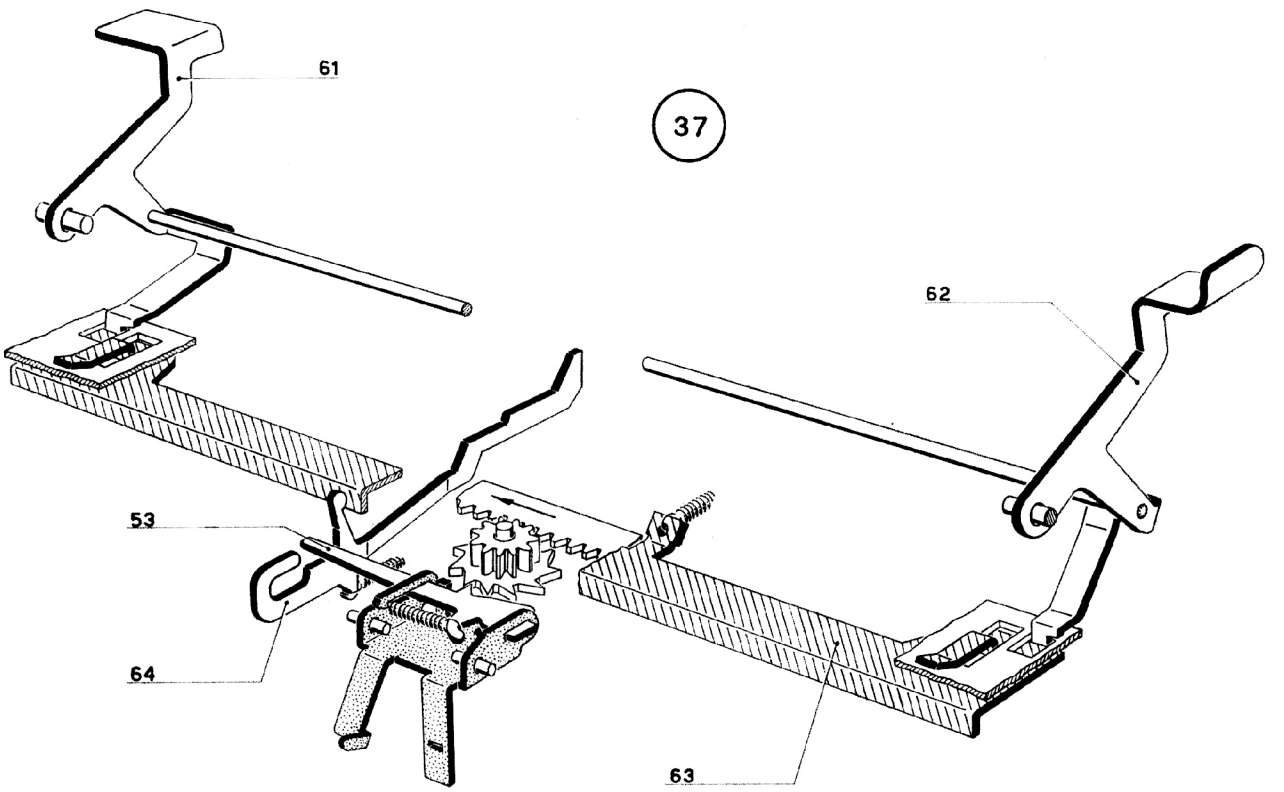
36

Carriage Release

By actuating the appropriate lever the carriage moves from left to right freely.

To move the carriage from right to left quickly we must release the movable dog from the escapement wheel.

By lowering one of the carriage release levers **61** and **62** the plate **63** is pushed forward; this plate will drag the rod **64**. This latter will release the movable dog **53** from the wheel; the carriage can therefore be moved from right to left and vice versa freely.



1 - FIGURE 38

Adjusting the rest position of the carriage release frame.

a) The carriage release frame 19 0 030 S is stabilised at rest by two extensions **A** and **B** which are resting on appropriate slots made in the movable guide.
The frame 19 0 042 S is resting on the same extensions **A** and **B**.

b) Check that at rest the two wings **A** and **B** rest both at the bottom of the appropriate slots. Form if necessary the wings.
Check at the same time the little clearance **L** which assures the exact rest position of the movable dog.

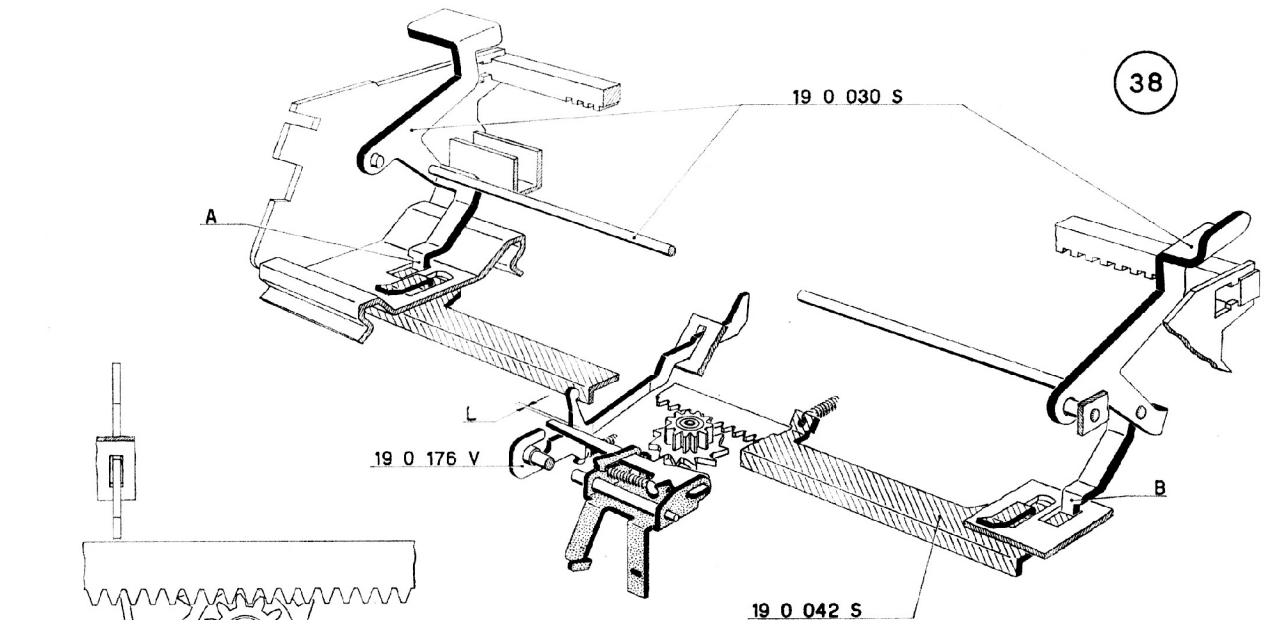
2 - FIGURES 38 and 39

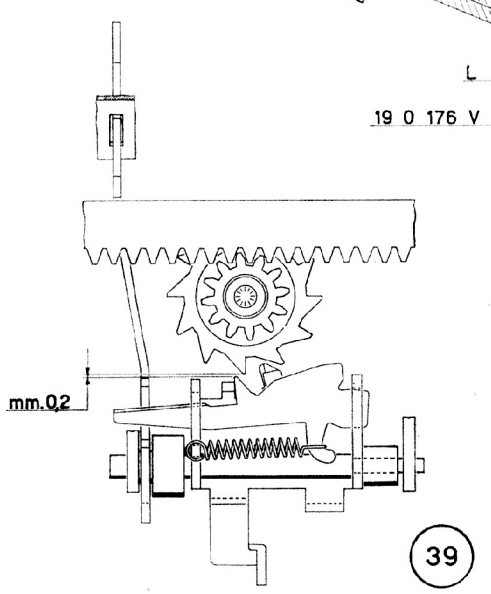
Adjusting the work position of the carriage release frame.

We know that by moving the carriage release levers to work position the movable dog is released from the escapement wheel.

a) Move the carriage release levers to work, that is to contact the margin rack (figure 38).

b) In these conditions we should have the clearance of 0.2 mm. shown in the figure 39.
Form if necessary the two arms of the carriage release frame to increase o reduce their possible rotation.





Back Spacer

The back-space attachment must control the carriage travel step by step from left to right (return).

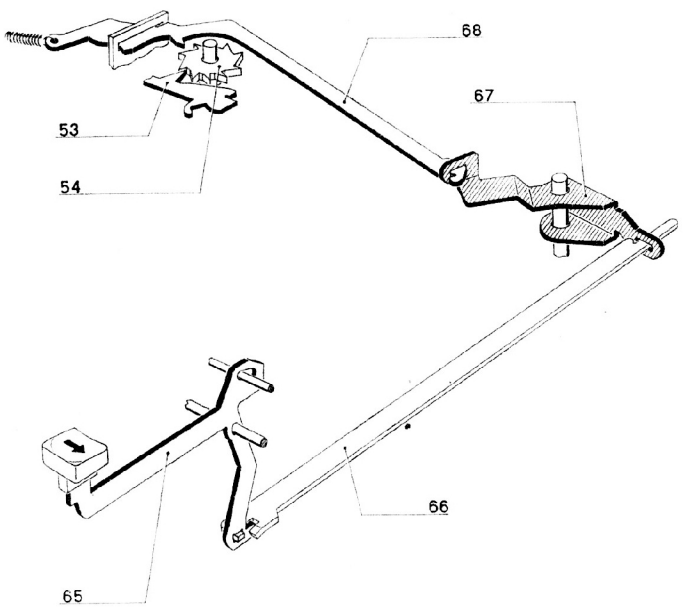
We must therefore control the « back-space » from the escapement wheel; this movement will be consequently transmitted to the carriage.

a) In the figure 40 we have illustrated the whole back-space attachment (at rest). In the figure 41 we have repeated the same position of the attachment but not in perspective.

b) By depressing the back-space key the hook **68** moves the escapement wheel (actuating the hachured tooth) from the position illustrated in the figure to that of figure 42.

The movable dog (when this key will return to rest position) will move to engage with the precedent tooth (see the blackened teeth).

40



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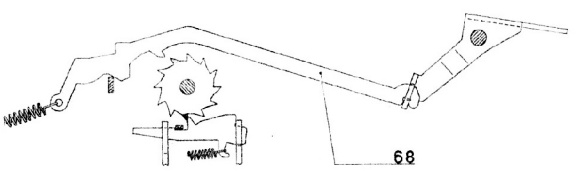
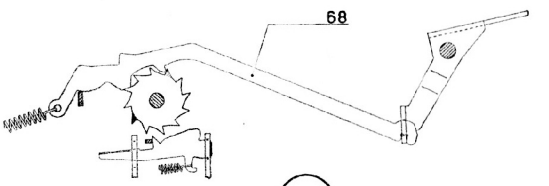




42

Tabulator

The one-key tabulator is an attachment permitting to move the carriage quickly from right to left (forward) stopping it in preset spots from which the operator wants to start columns.

This attachment can be divided into two main parts:

— that which sets the « starting points » of the different columns (tabulator setting) and clears such « starting points » (tabulator clearing)

— that which moves the carriage quickly to these « starting points » (tabulator).

Setting and clearing the « stops ».

a) The « stops » of the tabulator must set the « starting points » of the columns.

These stops are fitted in an appropriate guide **73** fixed at the rear of the movable guide. In the figure 43 the stops are illustrated at rest.

b) To set a « stop » move the carriage to the wished position and then rotate the lever **69** in the direction of the arrow **A.** The rod **70** will rotate in the direction of the arrow the setter **71** which will move the stop **S** to the rear.

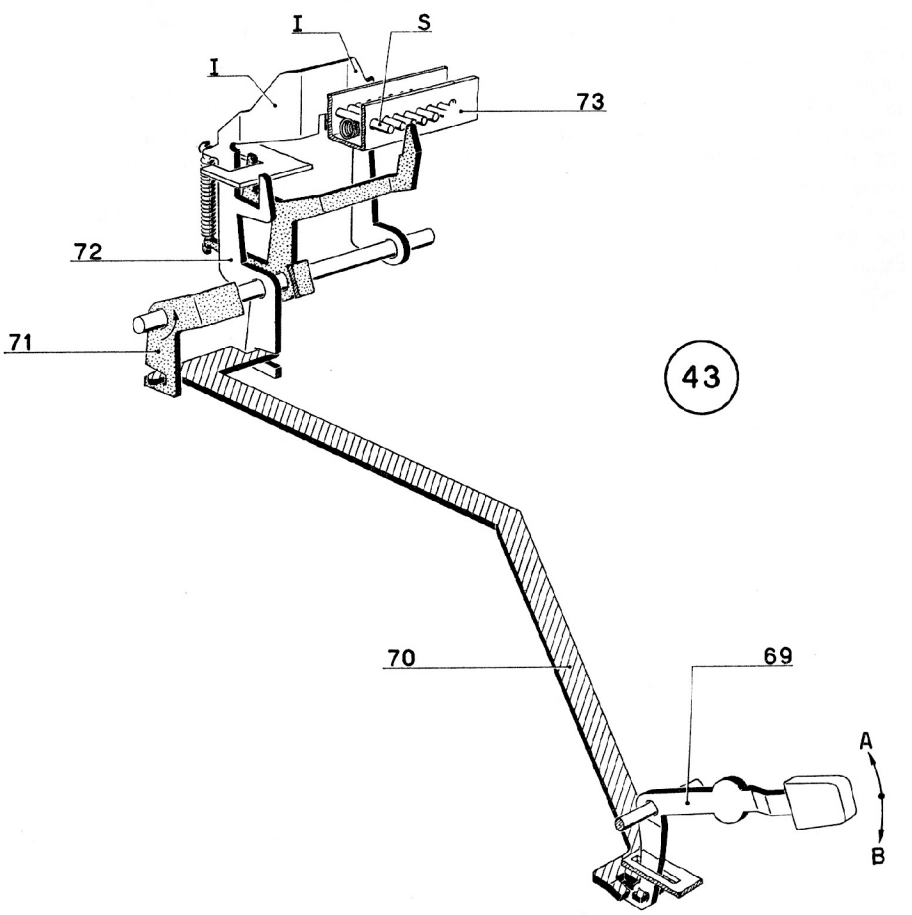
This stop as we shall see will stop the carriage exactly there (the printing will start from there).

c) By moving the lever **69** in the direction of the arrow **B** the stop set is pushed to rest by the bridge **72**.

d) If, on the guide **73**, we have set several stops we now wish to clear (moving them to rest position), it will be sufficient:

— to move the lever **69** in the direction of the arrow **B**

— to move the carriage to and fro. The two inclined planes **I** of the bridge **72** will move the stops set back to rest.



43

One-key tabulator.

It releases the carriage which can be moved to the point where the stop has been set.

a) Suppose the carriage is in the position illustrated in the figure with the stop **S** « set ».

b) When we depress the tabulator key the lever **74** rotates through the rod **75** the bridge **76** in the direction of the arrow. The bridge must:

— push forward the rod **64** which will release the movable dog **53** of the escapement wheel. The carriage actuated by its spring will be free to move leftward

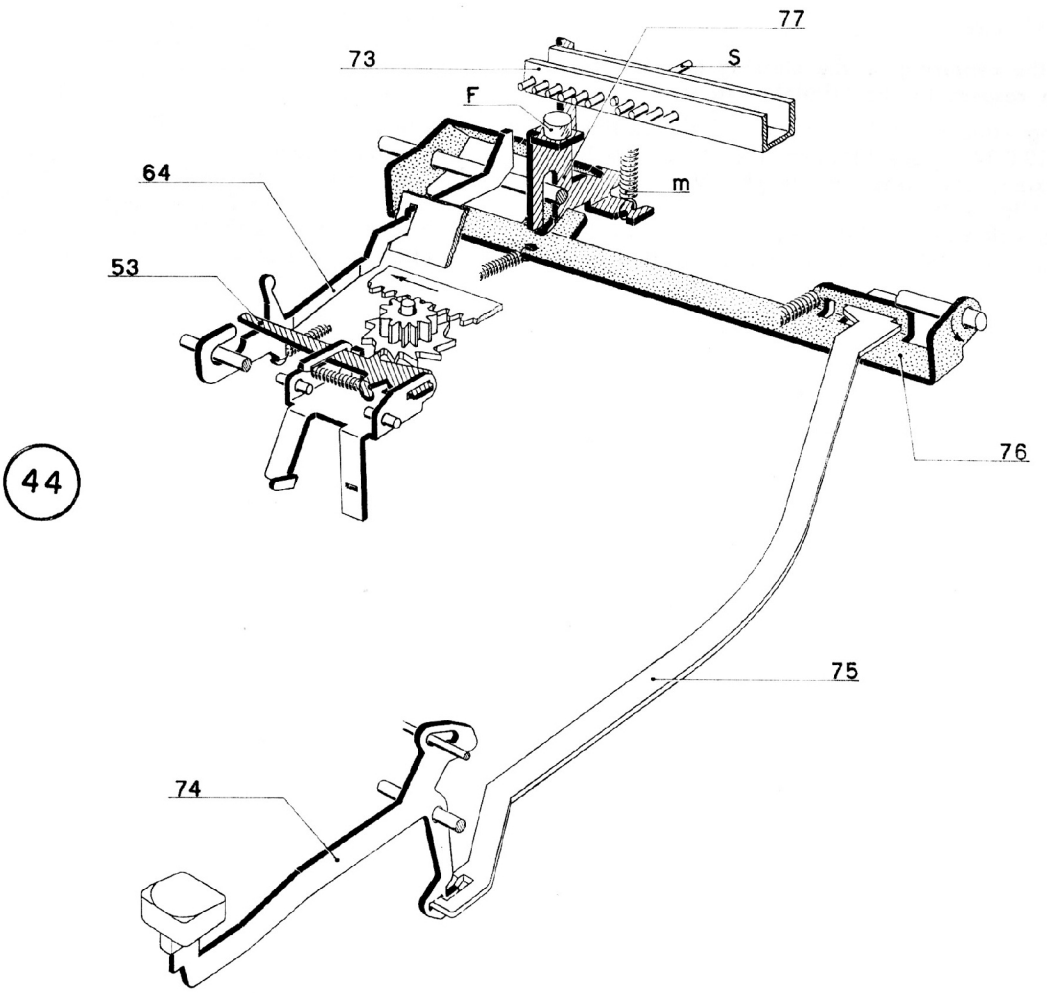
— permit the raising (thanks to the spring **m**) of the small plate **77**.

This small plate **77** should exactly:

— move the braking piece **F** against the guide **73**. The carriage will slow down and move smoothly

— move its upper end to interfere the trajectory of the stop **S** set.

c) When the stop **S** meets the small plate **77** the carriage stops. By letting the tabulator key moving back to rest the movable dog **53** engages again with the escapement wheel before the small plate **77** leaves the stop **S**.



44

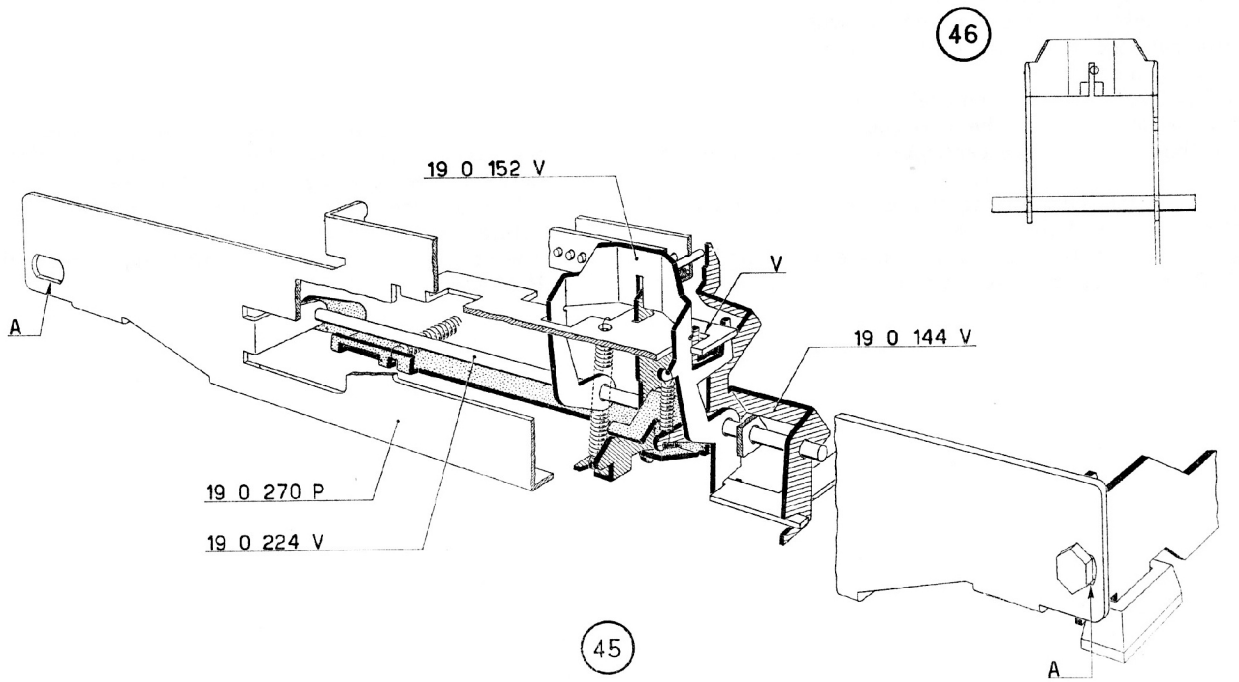
1 - FIGURES 45 and 46

Adjusting the centering of the clearing and setting attachment with respect to the tabulator stops.

a) The clearing attachment 19 0 152 V and the setting attachment 19 0 144 V are fitted on the shaft 19 0 224 V and are axially stabilised by the slot **V** of the plate 19 0 270 P (figure 45).

b) The axial position of the clearing attachment 19 0 152 V must permit to obtain the condition illustrated in the figure 46 that is: only half stop must be visible in the slot made in the clearing attachment.
This condition is obtained by moving the plate 19 0 270 P with respect to the two side-plates of the machine. The plate is in fact supplied with two slots **A** permitting this movement.

c) The setting finger 19 0 144 V must be on the contrary perfectly centered with respect to the stop which is in connection with the slot of the clearing attachment (that is the slot seen at point *b*).



45

46

2 - FIGURE 47

Adjusting the carriage release by means of the tabulator key.

By depressing the tabulator key:

— the carriage is released, that is the movable dog is disengaged from the escapement wheel.

— the carriage must be « slowed down » so that it moves smoothly.

It will be necessary that the brake starts working before the movable dog releases the carriage; only in this way and from the beginning, the carriage will move at a limited speed.

a) Depress the tabulator key to rotate the frame 19 0 077 V in the direction of the arrow.

b) The wing **H** of this frame will leave the small plate 19 0 383 V which actuated by the spring **m** will rise. The braking shoe **E** of the small plate will meet immediately the tabulator stops holding rail; the force exerted will depend upon the force of the spring **m** which can be varied by forming suitably the extension **A** of the small plate 19 0 383 V.

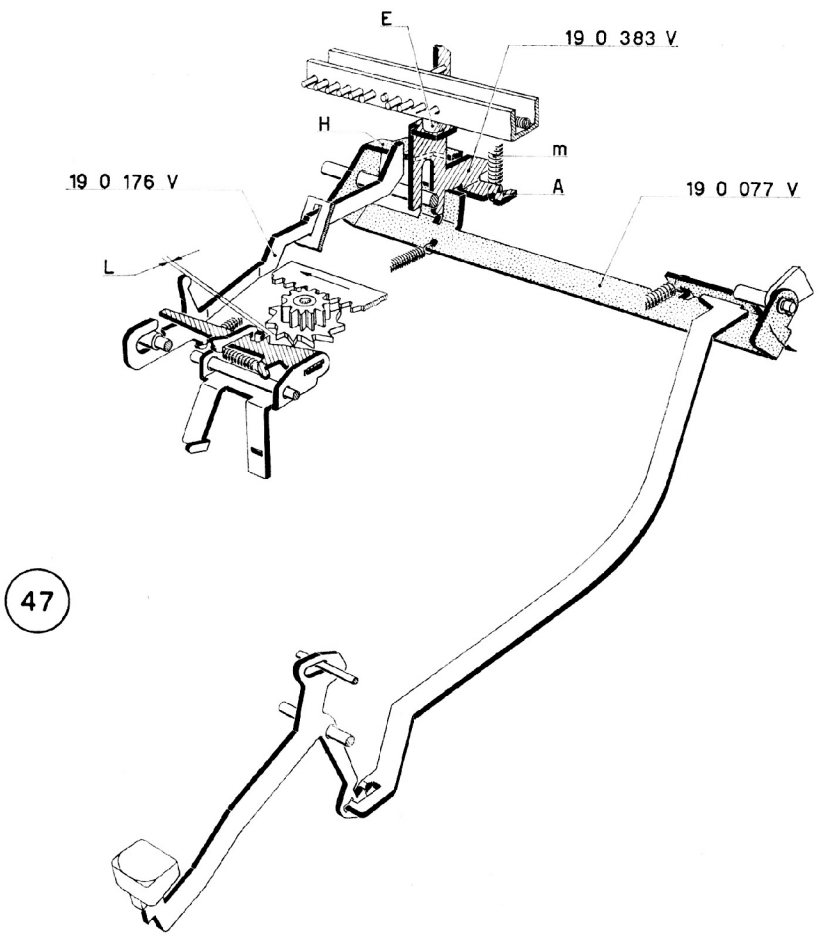
To be sure that the carriage is not too muck braked:

— move the carriage ten spaces before end travel

— depress the tabulator key. The carriage must move and reach smoothly end travel.

c) The same frame 19 0 077 V will push forward the rod 19 0 176 V which will release the movable dog from the escapement wheel. We must obtain a clearance **L** between the movable dog and the teeth of the wheel; this clearance must not be excessive that this able to rotate the rocking plate.

The condition is obtained by forming suitably the wing **H** of the frame 19 0 077 V.



47

Margin Stops and Margin Lock

To establish the starting point of the writing line there is the left margin stop which determines the « left margin ».

The right margin stop establishes the writing line end and therefore the « right margin ».

To go beyond these margins depress the margin release key when the carriage is against the left or the right margin stop.

The left margin stop permits also to start the writing line six steps before the left margin. To obtain this paragraph indentation it is sufficient to depress the margin release key holding it down during carriage return.

The right margin stop must also:

— warn the operator that the writing line is at the end

— stop the carriage (as said above) by locking the space bar and the printing keys. Since the carriage is stopped, the letters typed should be printed one over another.

The locking of the printing described above happens also when the carriage has reached « end travel ».

Right margin stop.

a) The right margin stop **83** (as the left one) is fitted on on appropriate rack **82** placed between the two sides of the movable guide.

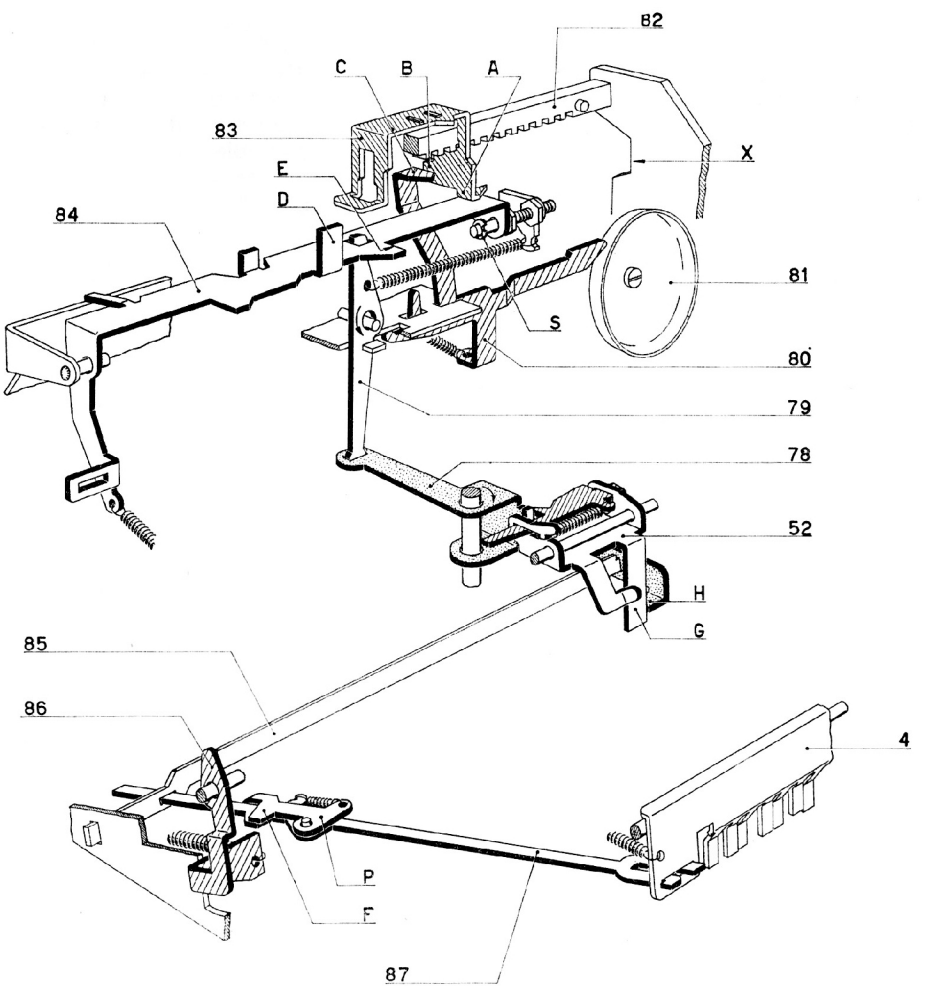
b) On the rear plate of the machine there is the release frame **84** secured by means of appropriate pins; this frame is constantly held at the right by means of its spring.

c) Some steps before the right margin stop stops the carriage, the extension **B** of the margin stop actuates the wing **C** of the hammer **80** which rings the bell **81**. The operator knows that the writing line is at the end.

d) By carrying on typing, the extension **A** of the margin stop **83** will contact the wing **D** of the release frame **84**. This frame will move leftward to rest against the slip **S** fitted on its right guide pivot.
The frame **84** will be compelled to stop as well as the carriage.

e) While moving to the left the frame **84** rotates in the direction of the arrow the lever **79** which at its turn rotates the rocker **78**.
This latter:
— moves its wing **H** behind the extension **G** of the rocking plate **52** which will be therefore locked and unable to control the escapement
— moves to the left the rod **85** which will displace the extension **F** of the small plate **P** behind the small plate **86**. The ribbon drive plate **4** will not be able to rotate; the keyboard will be locked. The flexible joint of the small plate **P** will start working when the locking happens when a key is depressed.
Please note that a strong spring is hooked to the small plate **86**. Therefore the locking of the keyboard is not rigid.

f) Once the carriage is released from the right margin stop as we shall see, it is free to continue its travel. The carriage will be stopped at last when the profile **X** of its right side-plate will meet the extension **E** of the release frame **84**. The lockings described at point *c*) will be reinstated.

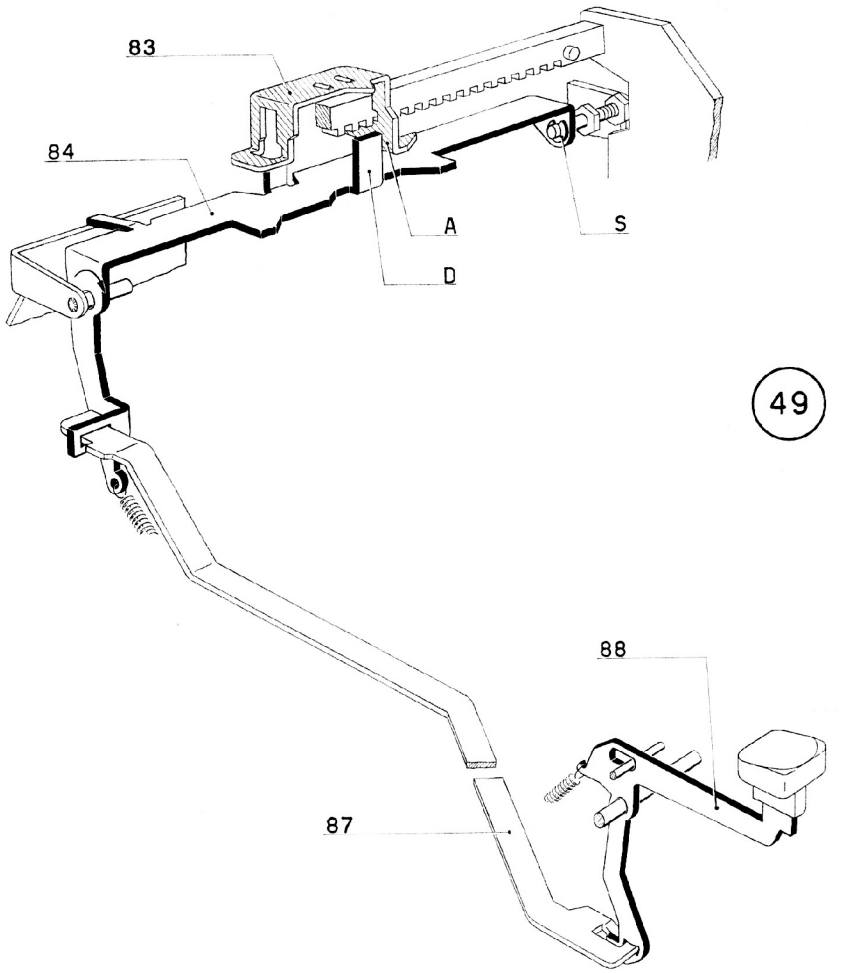


48

Margin release.

a) In the figure the carriage is locked by the right margin stop **83.** The extension **A** of the margin stop is against the wing **D** of the release frame **84** which rests on the clip **S** of its right support.

b) By depressing the margin release key the stem **88** pushes rearward the rod **87** which will rotate the frame **84** in the direction of the arrow.
The wing **D** of the frame **84** will leave consequently the extension **A** of the margin stop; it will be therefore possible typing again until the carriage reaches the end of the line.



49

Left margin stop.

a) When the carriage is moved fully to the right it is stopped when the extension **M** of the left margin stop **89** meets the wing **D** of the release frame **84.**

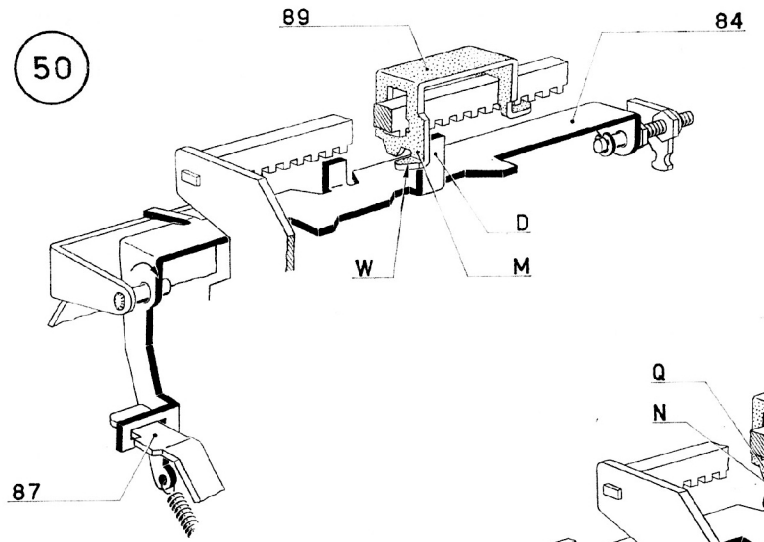
b) If it is required to go beyond the « left margin », it is sufficient to depress the margin release key. The frame **84** is compelled to rotate in the direction of the arrow and permits this operation.

c) Once the carriage has moved beyond a margin stop, it is sufficient to displace the carriage to make it return within the margin stops set. The inclined plane **W** of the wing **M** permits this operation.

Paragraph indentation.

If we keep the margin release key pressed down while the carriage is moved back to start a new line, the carriage will stop when the extension **Q** of the margin stop **89** meets the wing **N** of the frame **84.**

The writing line will start after the « left margin stop » by a space **L.**



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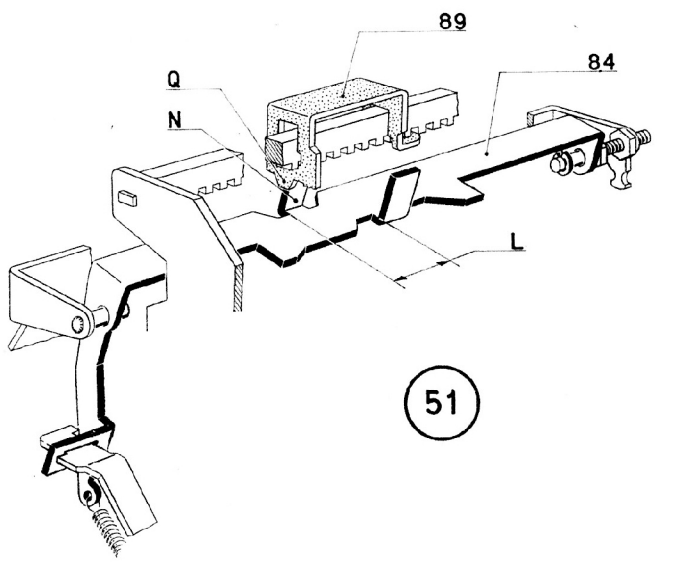


51

1 - FIGURES 52 and 53

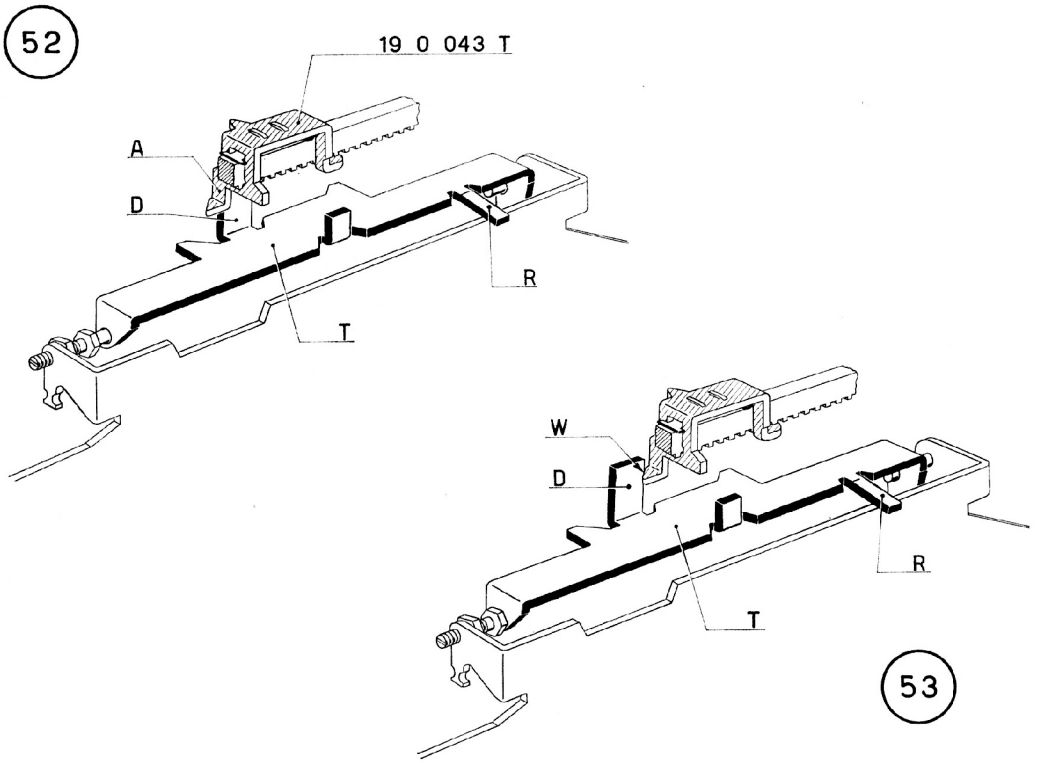
Adjusting the angular position of the release frame.

a) The wing **D** of the release frame **T** must stop surely the extension **A** of the margin stops (in the figure 52 only the right margin stop 19 0 043 T is illustrated).

b) Move the margin beyond its margin (in the figure 53 only the right margin stop is illustrated).

Move the carriage so that the margin stop « returns » within the fixed margin. The inclined plane **W** must actuates smoothly and without forcing the wing **D** to rotate the frame **T** and permit the « return ».

c) Both conditions are obtained by adjusting the angular position of the frame **T** by forming its extension **R**.



2 - FIGURES 54 and 55

Adjusting the axial rest position of the release frame. Constant return. Lockings.

This adjustment is done to assure that when the carriage is moved back to start a new line and once the position of the left margin is set, it stops constantly in the same position.

We know that by moving the carriage back the movable dog is released from the escapement wheel by the noiseless finger. It is therefore necessary when the carriage is stopped by the left margin stop that the movable dog may engage always with the same tooth of the escapement wheel.

Since it is not possible checking this condition because neither the tooth nor the wheel are visible, the required condition is obtained in the following manner and considering the last two steps the carriage can make before being stopped by the right margin stop.

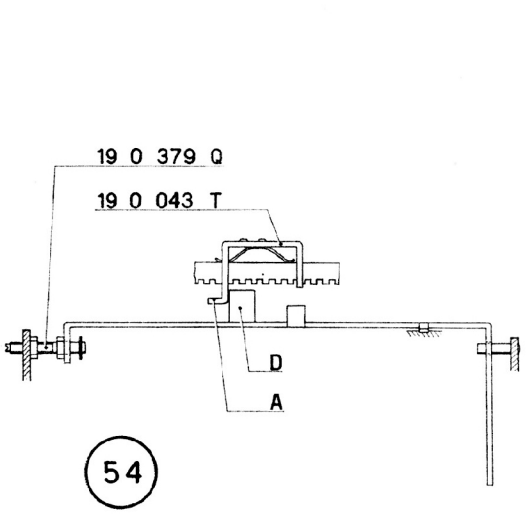
a) Set the position of the right margin stop. At the end of the next-before-last step the extension **A** of the right margin stop 19 0 043 T must be slightly against the extension **D** of the release frame (figure 54). This condition is obtained by moving suitably the support 19 0 379 on which is resting the frame.

b) At the end of the next step the frame has been moved thus performing all the lockings needed.
We should see:

— that the wing **A** of the rocker 19 0 032 Q passes with respect to the rocking plate with a little clearance **L**. Form if necessary the wing **A**

— that the wing **B** of the small locking plate passes with respect to the wing **C** of the small plate 19 0 426 Q with a little clearanace $\mathbf{L}_1$. Form if necessary the wing **C**

— that both wings **A** and **B** engage sufficiently with the parts to be locked. Form if necessary the arm **K** of the rocker 19 0 032 Q.



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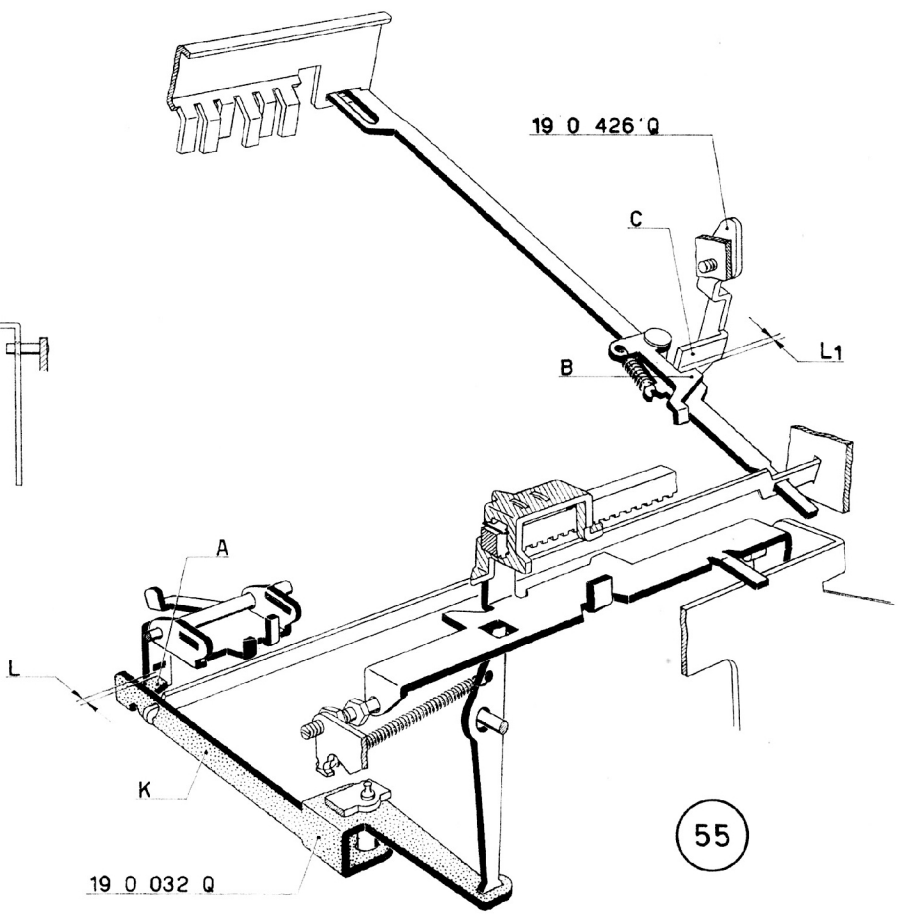


55

Line Space Clutch

When the writing line reaches the « right margin » it is necessary moving the carriage back and rotating at the same time the platen for a new writing line (line-space).

These two functions are controlled by the appropriate lever fitted on the right side-plate of the carriage.

It is also possible to control the rotation of the platen by means of the knobs fitted at both ends of it.

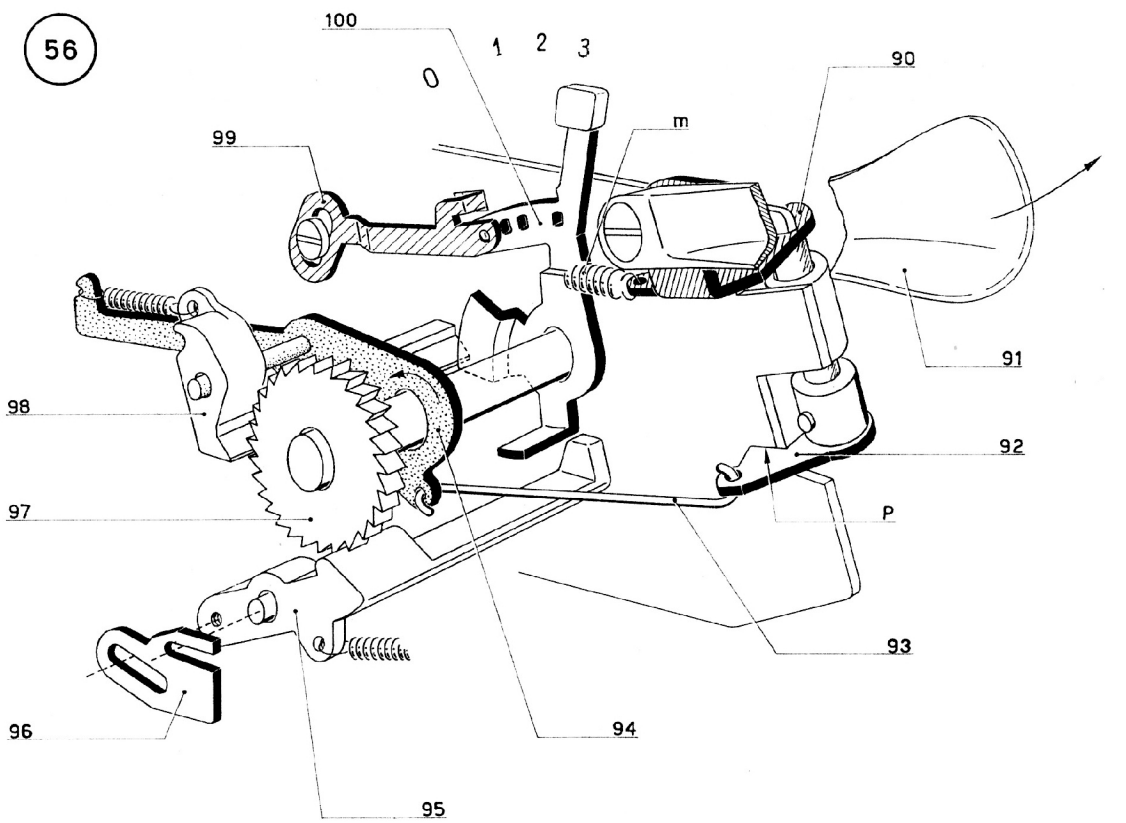
The left knob unit includes the line-space wheel to which is trasmitted the line-space control. This unit includes also a special device (clutch) which releases the line-space wheel from the platen.

Line-space of the platen.

a) The lever **91** by means of which the carriage is moved back also controls the line-space of the platen. It is fitted on the support with shaft **90** on which the crank **92** is integral to. Actuated by the spring **m** the rest position of the listed parts is given by the profile **P** of the crank **92** which rests on the left side of the movable guide.
By means of the stay **93**, the crank **92** is connected to the arm **94** which holds the line-space hook **98**.
By rotating the lever **91** in the direction of the arrow we rotate the arm **94** which will move the hook **98**.

b) The angular rest position of the hook **98** is given by the profile of the line-space cam **100**.

c) The line-space wheel **97** (which for the time being we may consider intergral with the left knob and therefore with the platen) is stabilised by the stabiliser **95**. On this latter is set the small plate **96** which, as we shall see, must determine the « end travel » of the line-space.

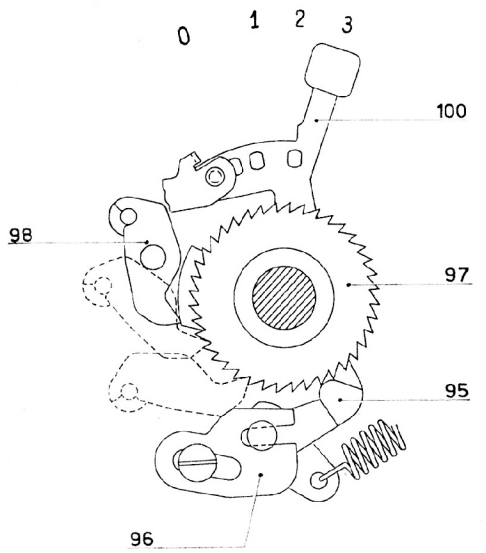


d) The line-space cam **100** can take four positions:
- — position 3: in which the platen must rotate by four teeth of the line-space wheel
- — position 2: in which the platen must rotate by three teeth of the line-space wheel
- — position 1: in which the platen must rotate by two teeth of the line-space wheel
- — position 0: in which the hook **98** cannot control the rotation of the line-space wheel and the stabiliser **95** is removed from the line-space wheel.

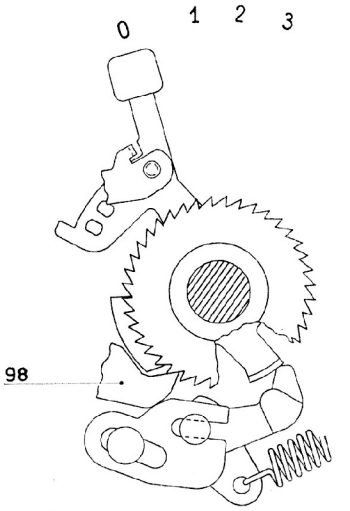
The platen can be rotated freely (by means of the knobs) to be brought to any position between two typed lines. By moving the line-space cam back to one of the other positions the line-space wheel will be engaged again by the stabiliser which will reinstate the position of the platen according to the precedent line-space.

In the figure 57 the line-space cam is in « position 3 ». The hook **98** by leaving the cam rotates the platen by four teeth of the wheel. The movement of the hook will be stopped by the small plate **96**.

e) In the figure 58 the line-space cam is in « position 0 ». It excludes the stabilizer and the hook **98** is inactive.



57

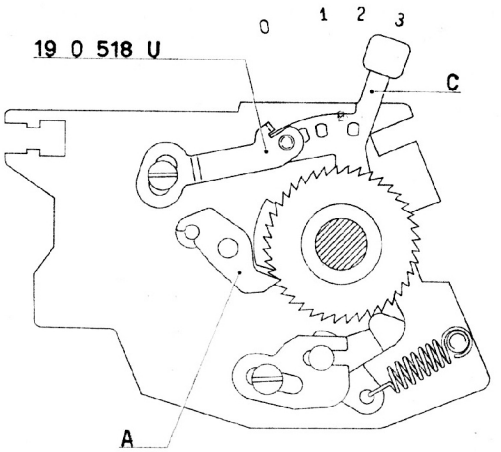


58

1 - FIGURE 59

Adjusting the positions of the line-space cam.

The line-space cam **C** is stabilised by the small plate 19 0 518 U. By moving suitably this latter see that in position 1, 2 and 3 the hook **A** falls exactly between the teeth of the line-space wheel.



59

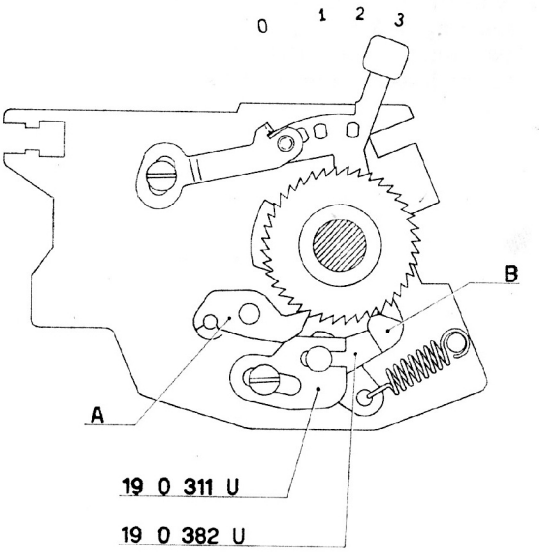
2 - FIGURE 60

Adjusting the travel of the line-space hook.

We know that with the cam in position 1, 2 and 3 the line-space wheel must be « exactly » moved by 2, 3 and 4 teeth.

In other words, we can say that when the hook **A** stops against the small plate 19 0 311 U the line-space wheel must be perfectly stabilised by the extension **B** of the stabiliser 19 0 382 U.

This condition is obtained by adjusting the position of the small plate 19 0 311 U.



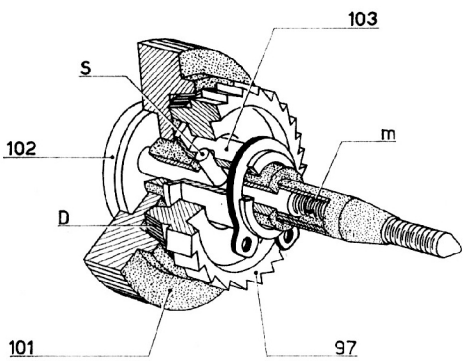
60

Clutch.

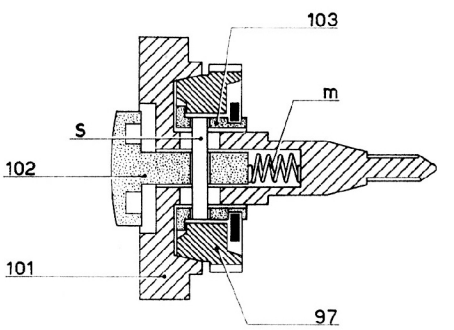
The left knob unit includes:
— the knob **101** which shaft is screwed in the platen. Knob and platen are integral
— the line-space wheel **97** which teeth **D** are engaging with the teeth of the knob **101**
— the ring **103** which by means of the pin **S** and of the clutch button **102**, gives a certain axial position to the line-space wheel **97**.

a) In the figures the clutch button pushed by the spring **m** is at rest. The teeth of the wheel **97** and of the knob **101** are engaged; consequently all the parts of the unit are integral.
b) By pushing the button **102** inside, the line-space wheel **97** is released from the knob. The wheel **97** will always be stabilised in the way we know while the platen can be rotated by means of the knobs to move the sheet of to the position wished.

61



62

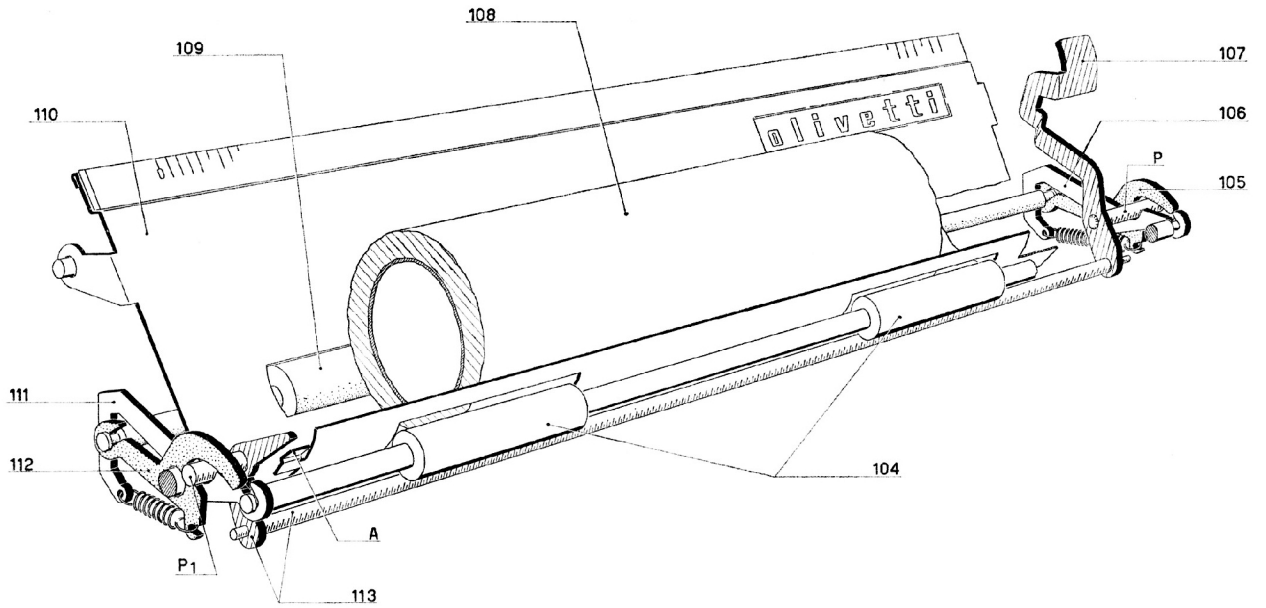


Paper Release

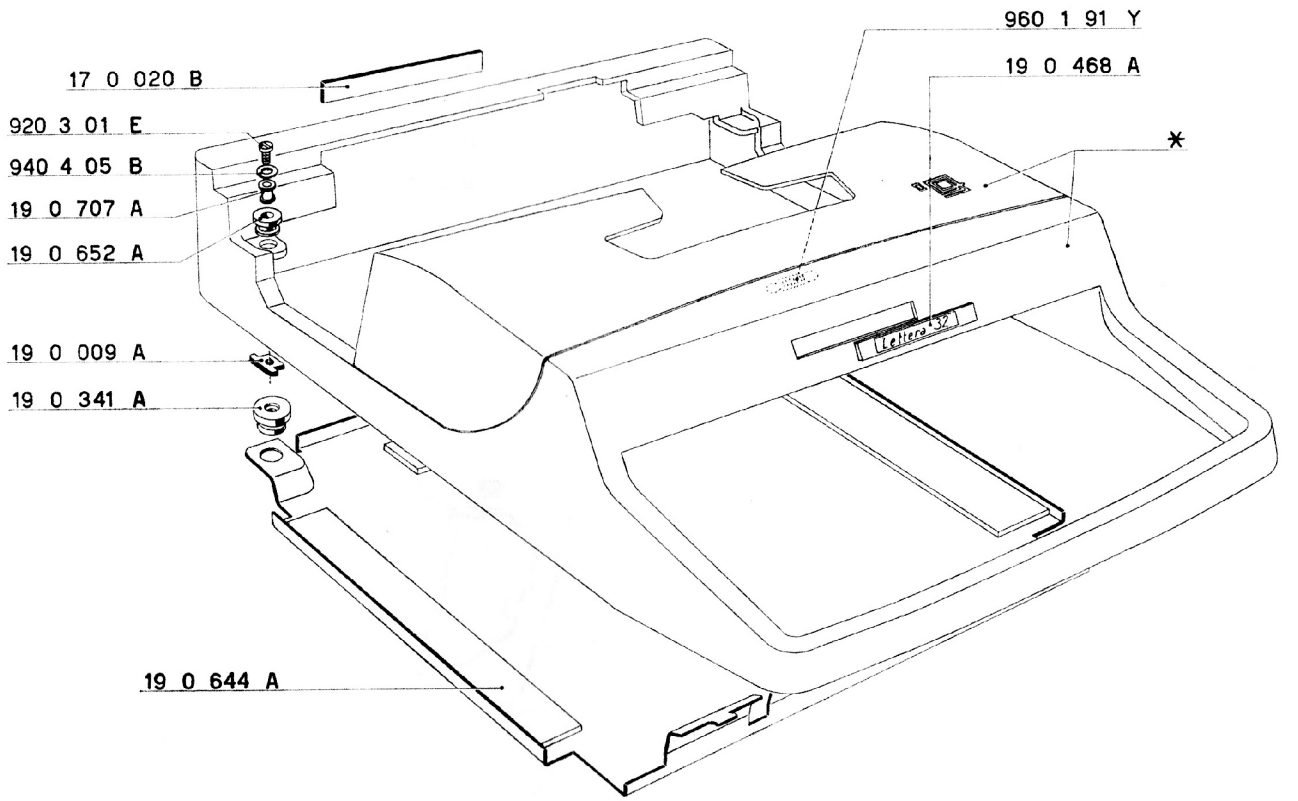
a) The sheet of paper is held against the platen **108** by the pairs of paper-feed rollers **109** and **104**.
The rollers **109** are held by the small levers **112** and **105** while the rollers **104** are held by the small levers **111** and **106**.
The paper guide plate **110** is held against the platen by a spring placed down and not visible in the figure.

b) By rotating the paper-release lever **107** forward:
— the pin **P** of the lever
— the pin $\mathbf{P_1}$ of the left lever **113**
remove the paper-feed rollers from the platen by actuating the pair of small levers; therefore the sheet of paper can be adjusted as required.
The upper extension of the lever **113** will actuate the extension **A** of the paper guide plate **110** removing it also from the platen.

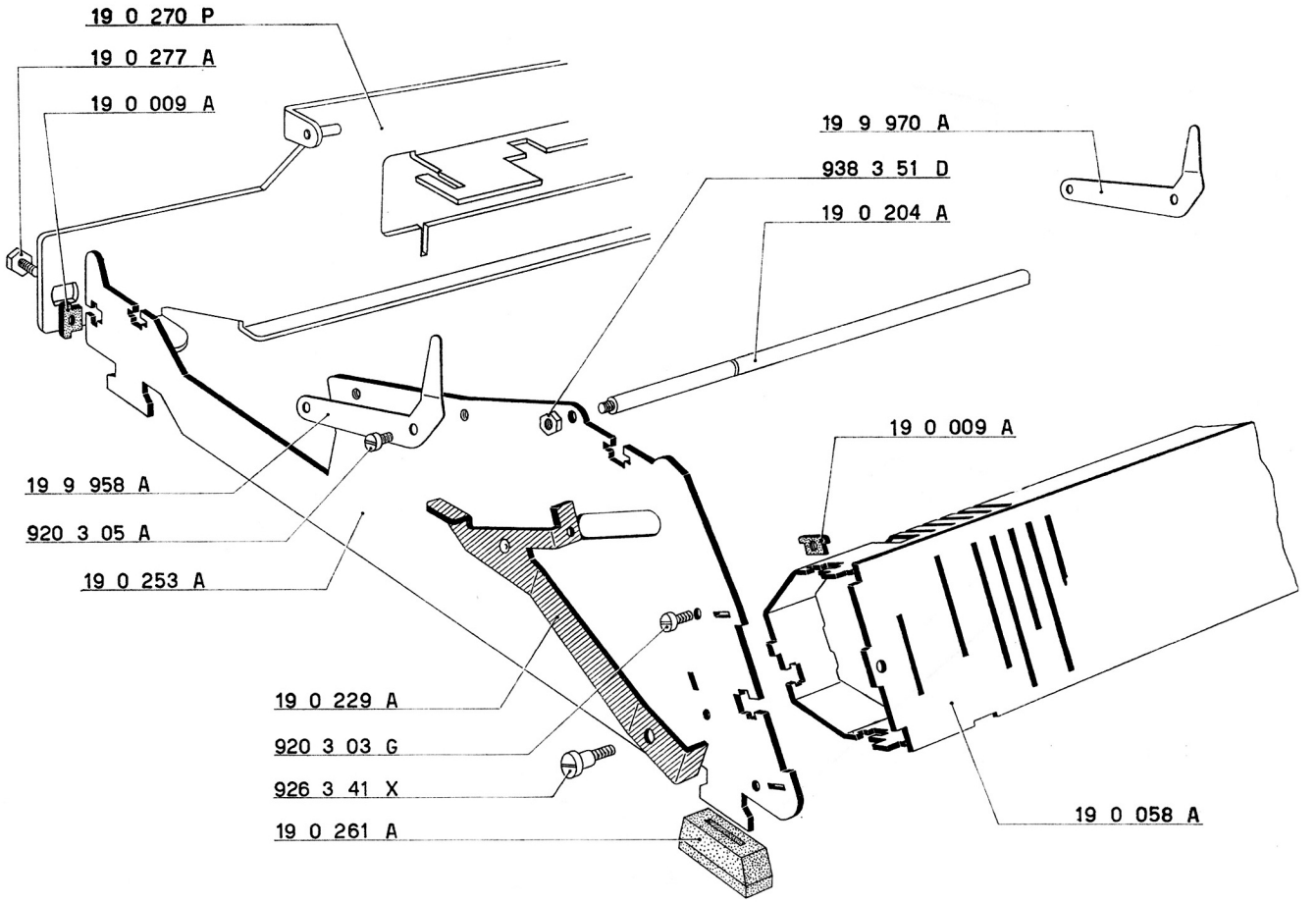
(63)



Parts Catalog: Casing, Frame and Touch Control



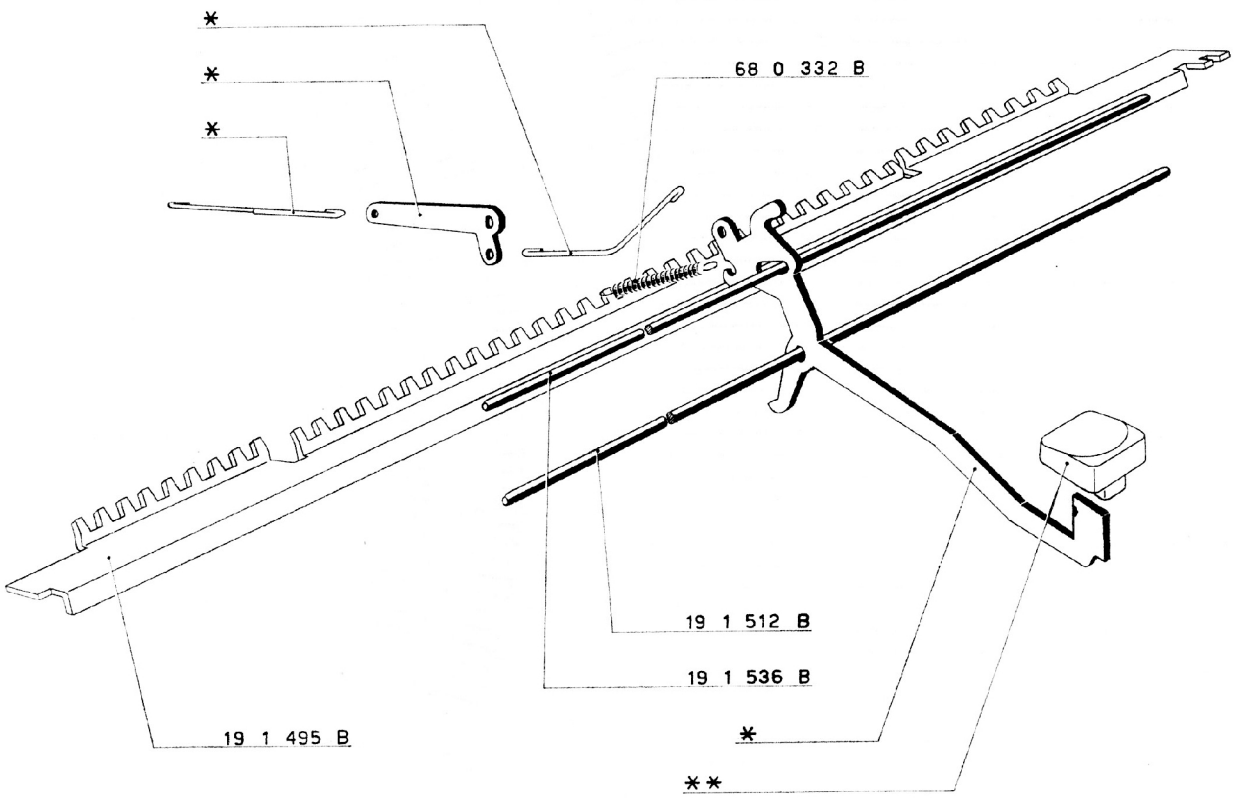
	*
Light-blue	19 0 548 A
Green	19 0 720 A
Diaspron colour	19 0 764 A
Red	19 0 859 A

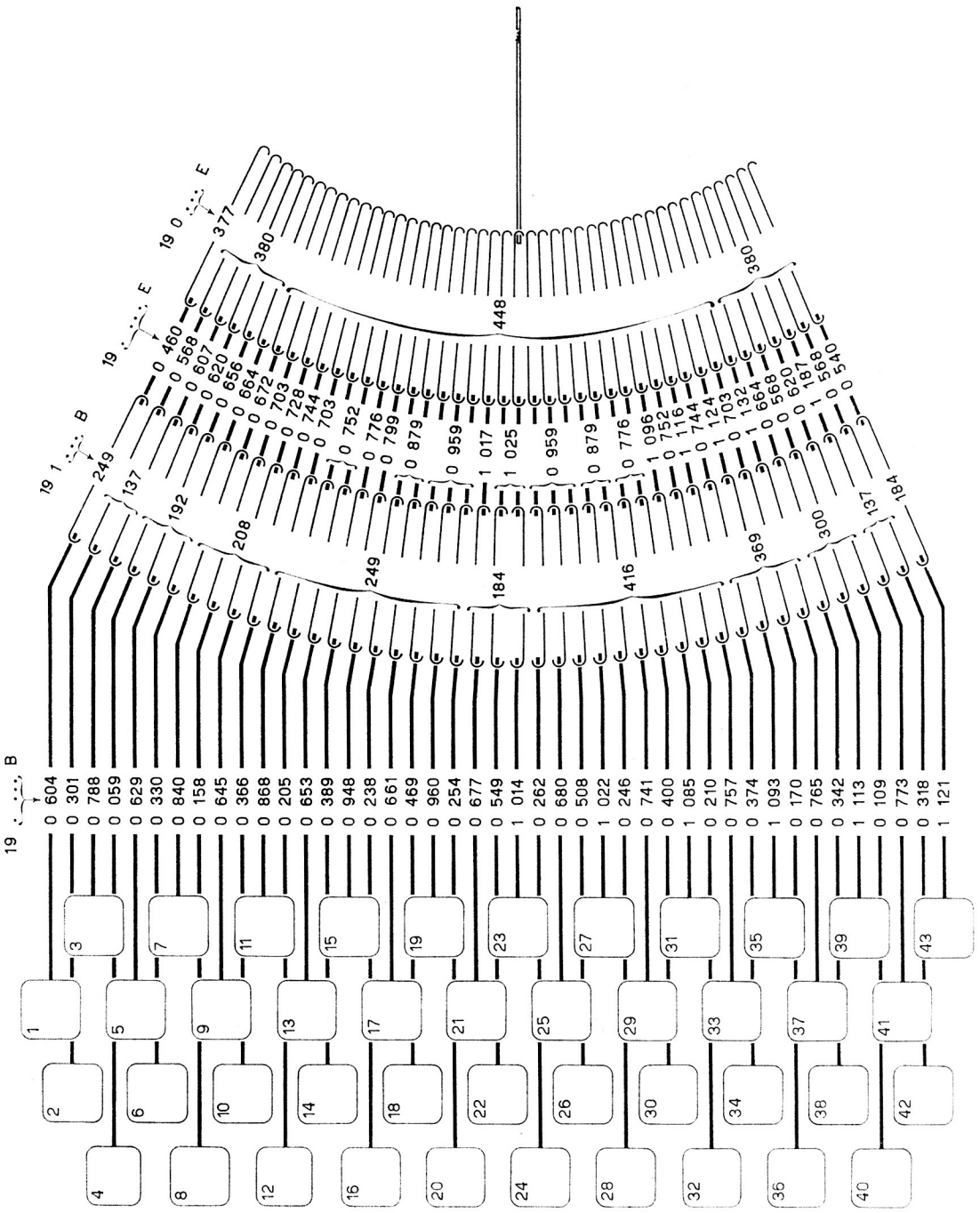

19 0 270 P
19 0 277 A
19 0 009 A
19 9 970 A
938 3 51 D
19 0 204 A
19 0 009 A
19 9 958 A
920 3 05 A
19 0 253 A
19 0 229 A
920 3 03 G
926 3 41 X
19 0 261 A
19 0 058 A

Parts Catalog: Keylevers

* The code number of the key-levers, of the transmission links, of the transmission levers and of the typebar links are listed in the scheme on page 110

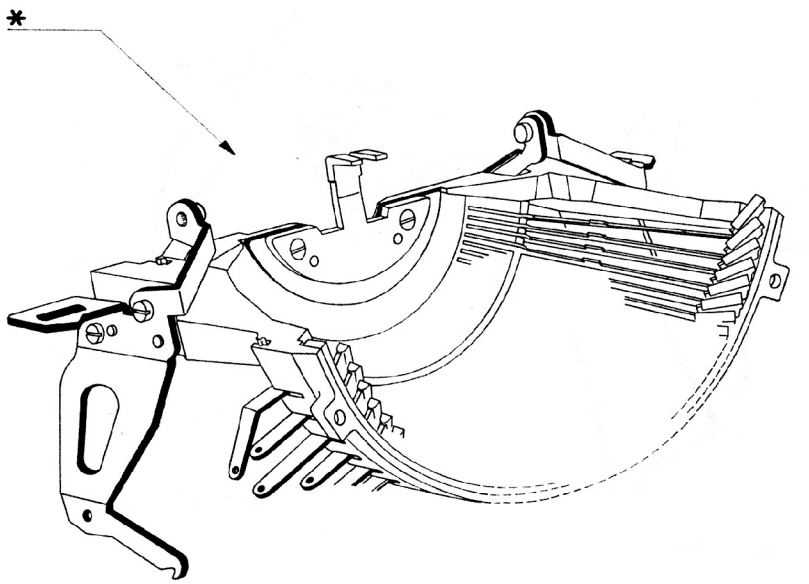
** 19 1 583 /B... (Specify the sign)

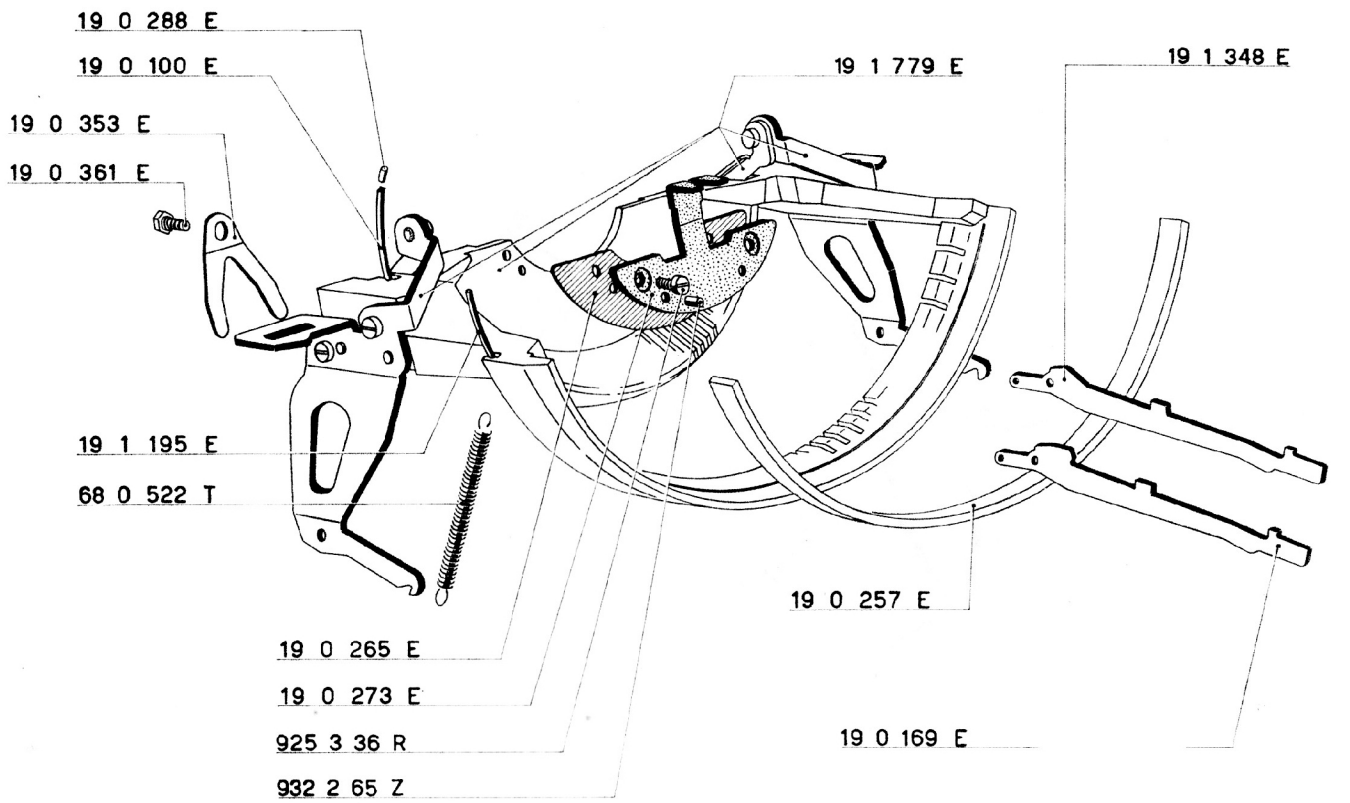




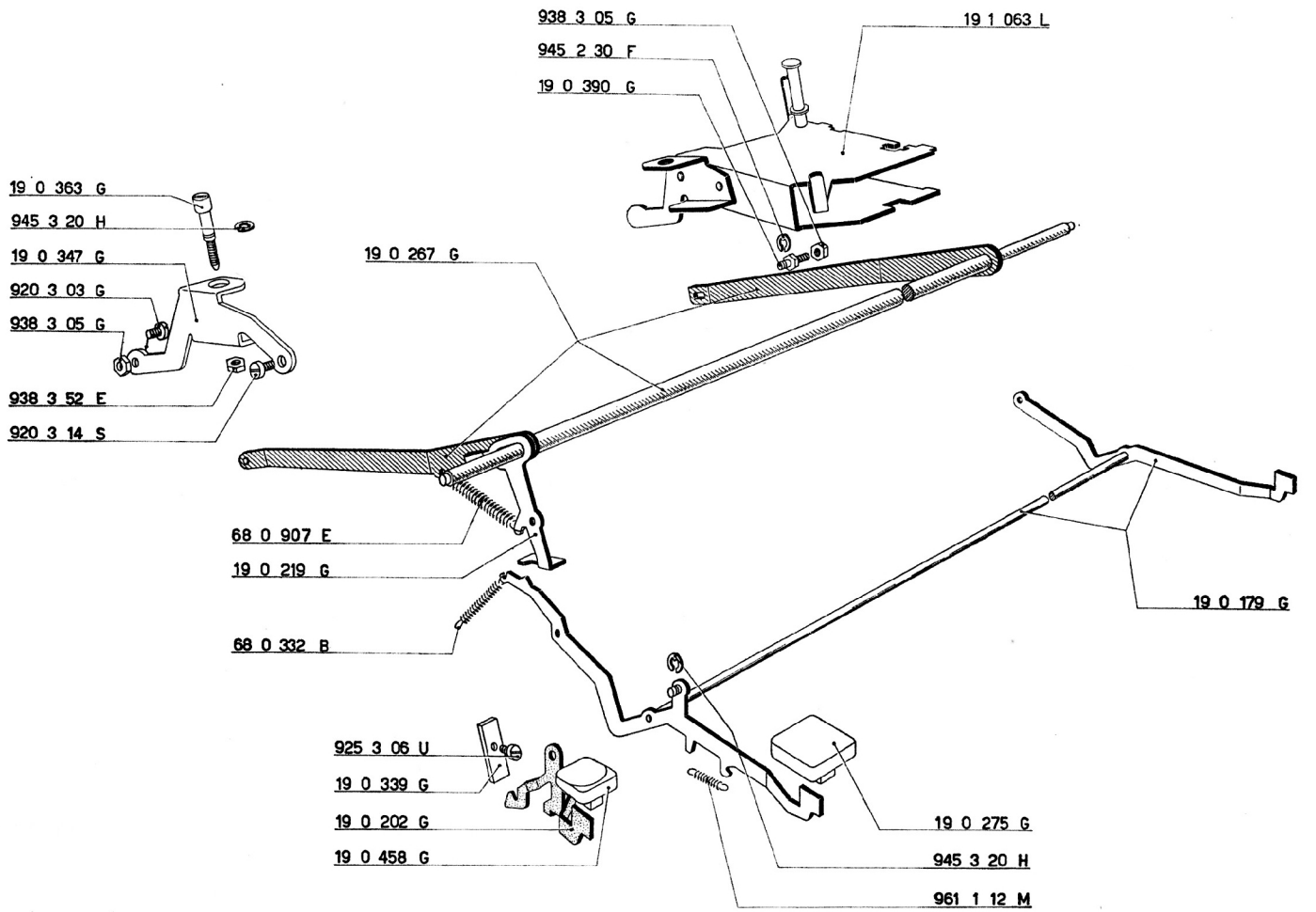
Parts Catalog: Segment and Universal Bar Frame

*	69 5 101 Z	Complete segment (Specify type face and keyboard)	

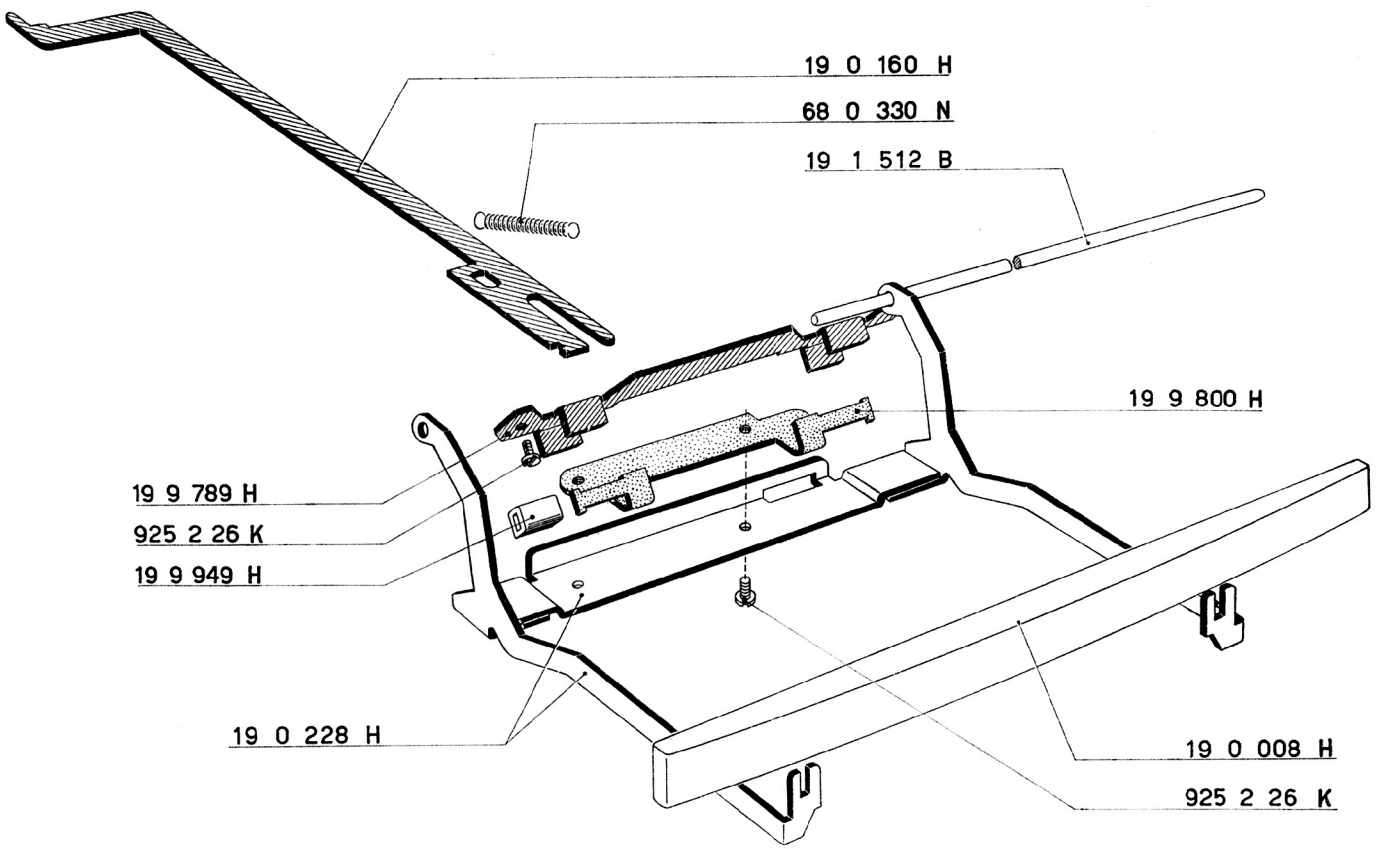




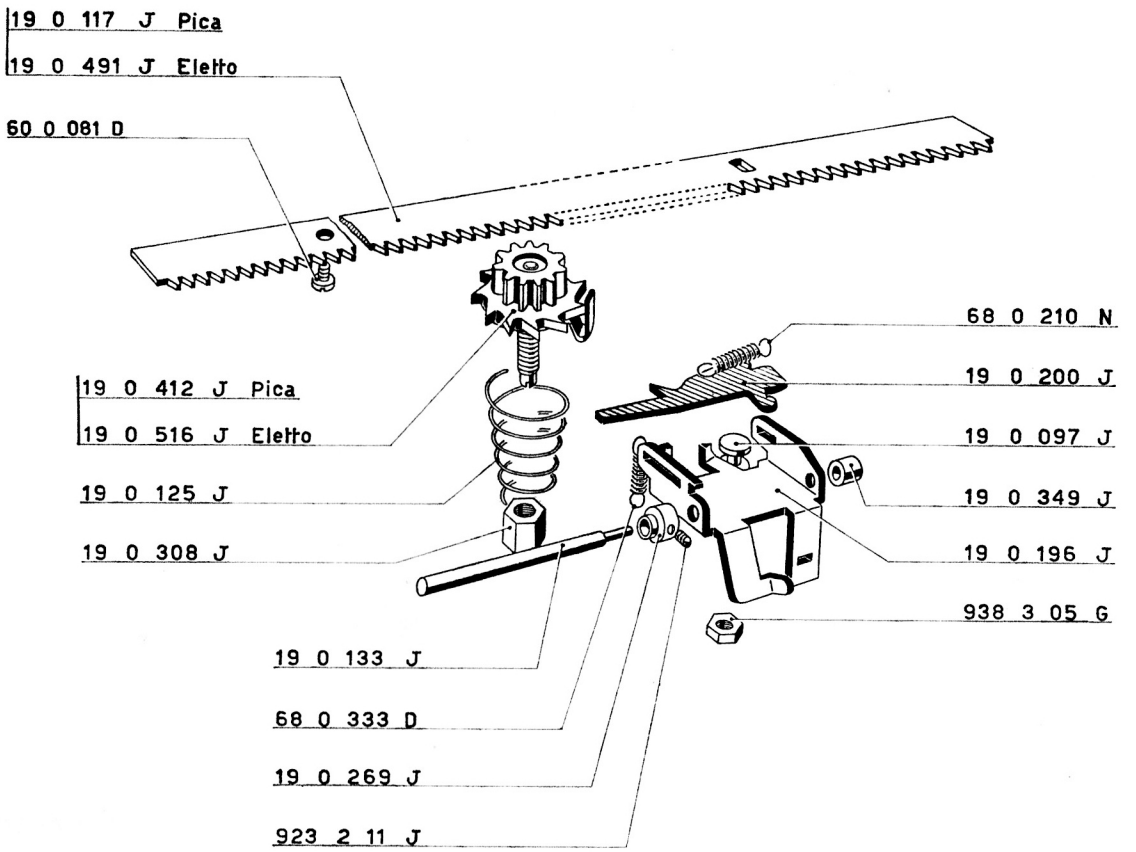
Parts Catalog: Shift Movement



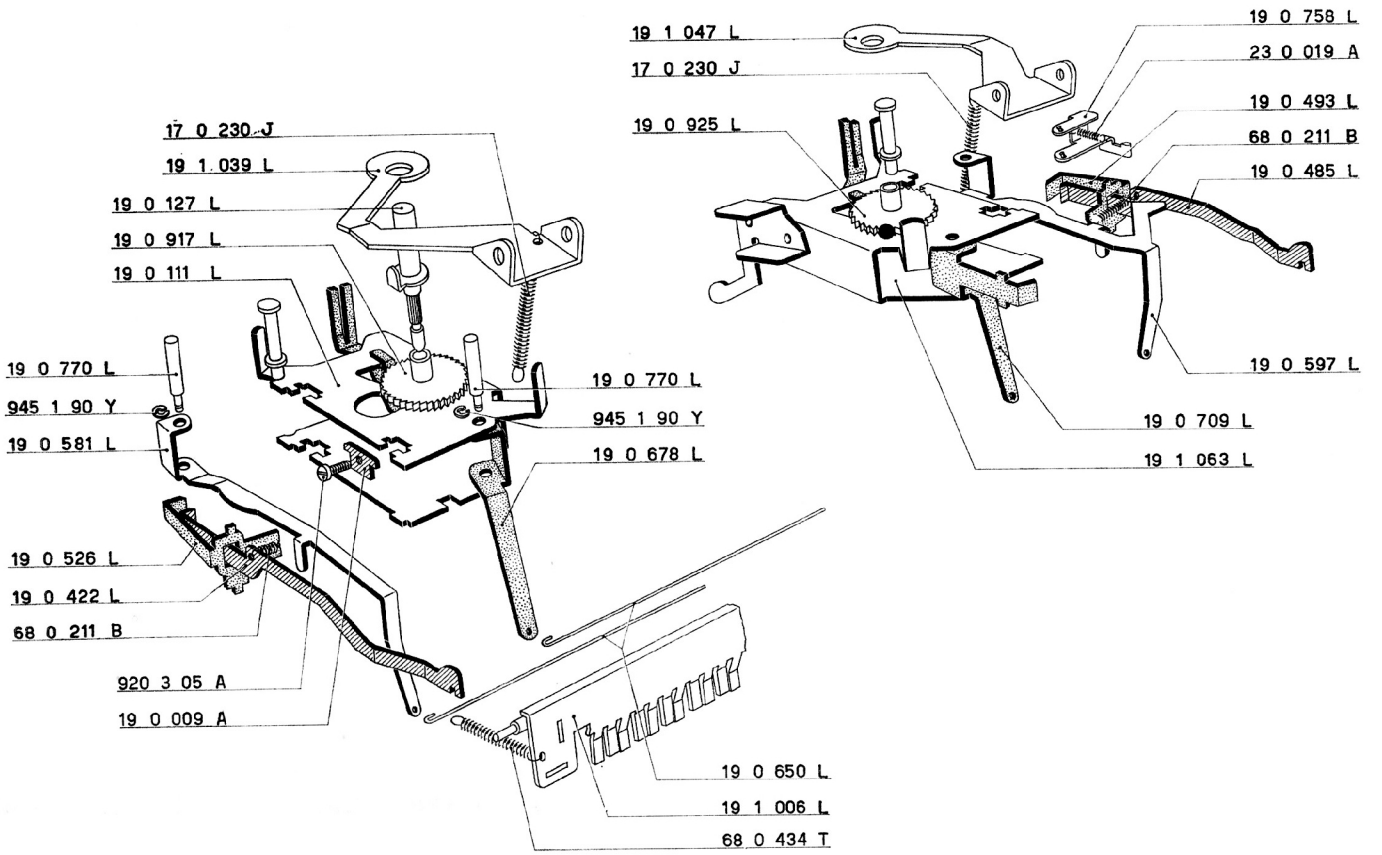
Parts Catalog: Spacer

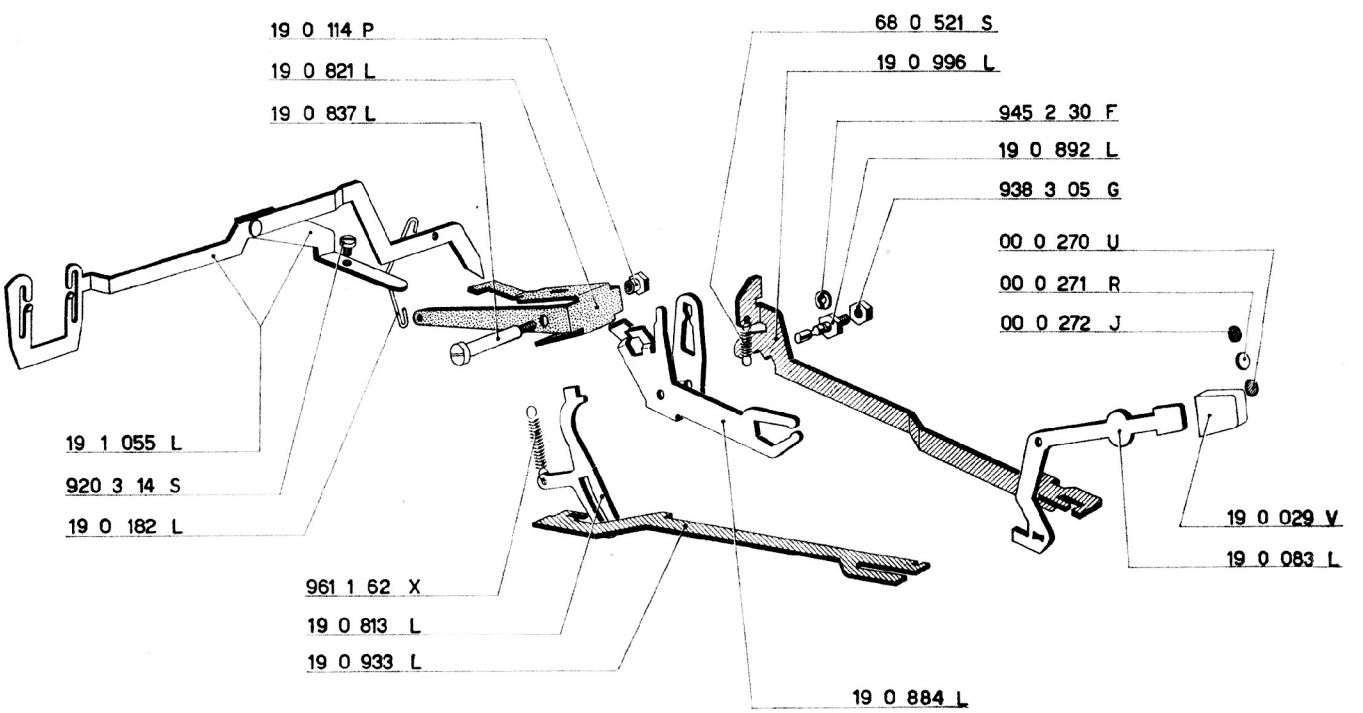


Parts Catalog: Escapement Rack

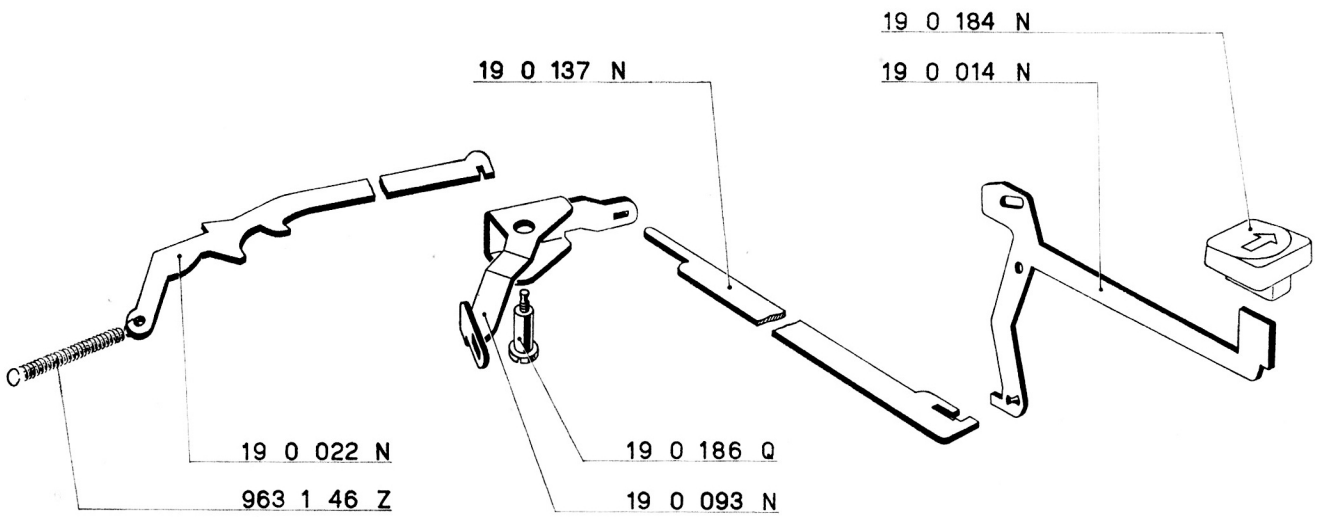


Parts Catalog: Ribbon Drive, Reverse and Bichrome

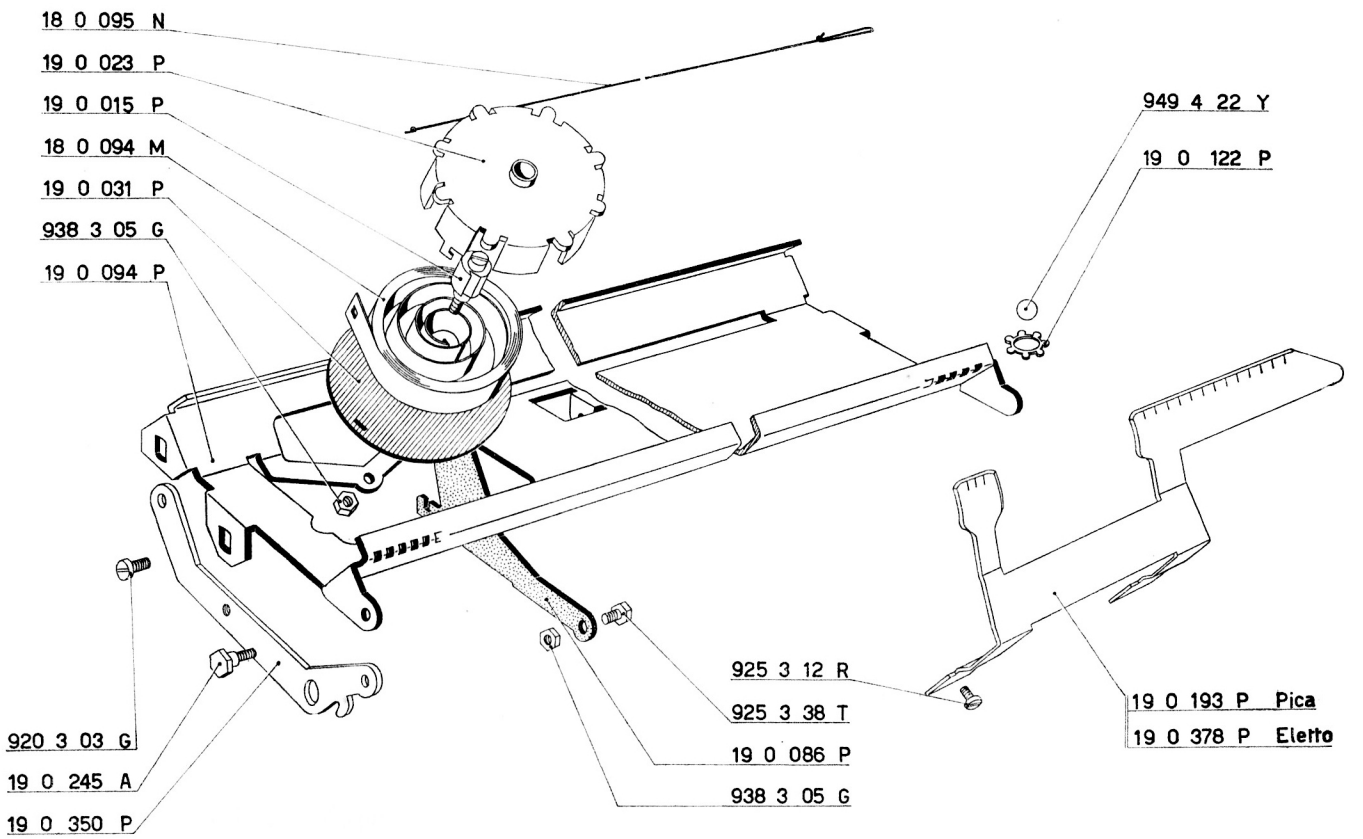




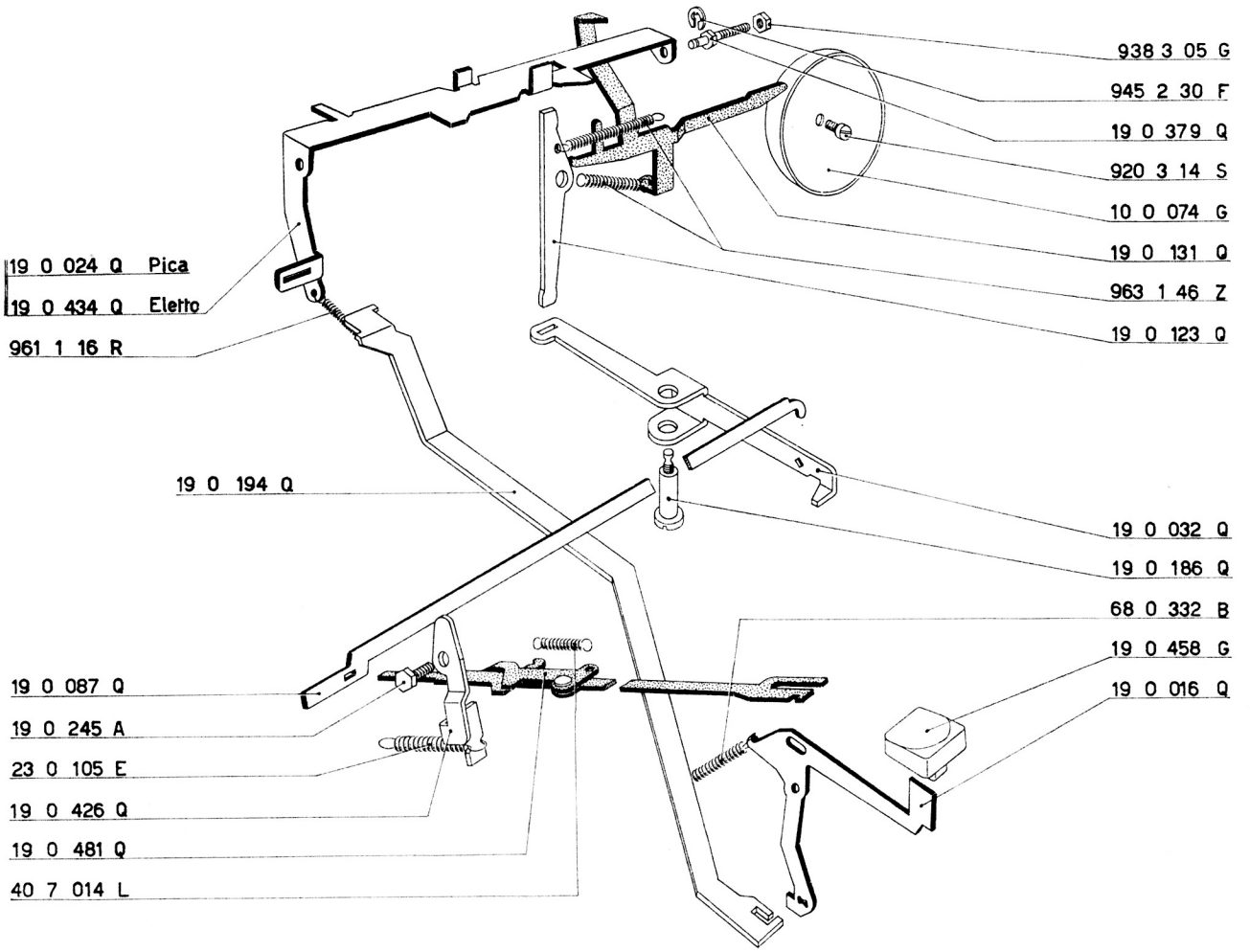
Parts Catalog: Backspacer



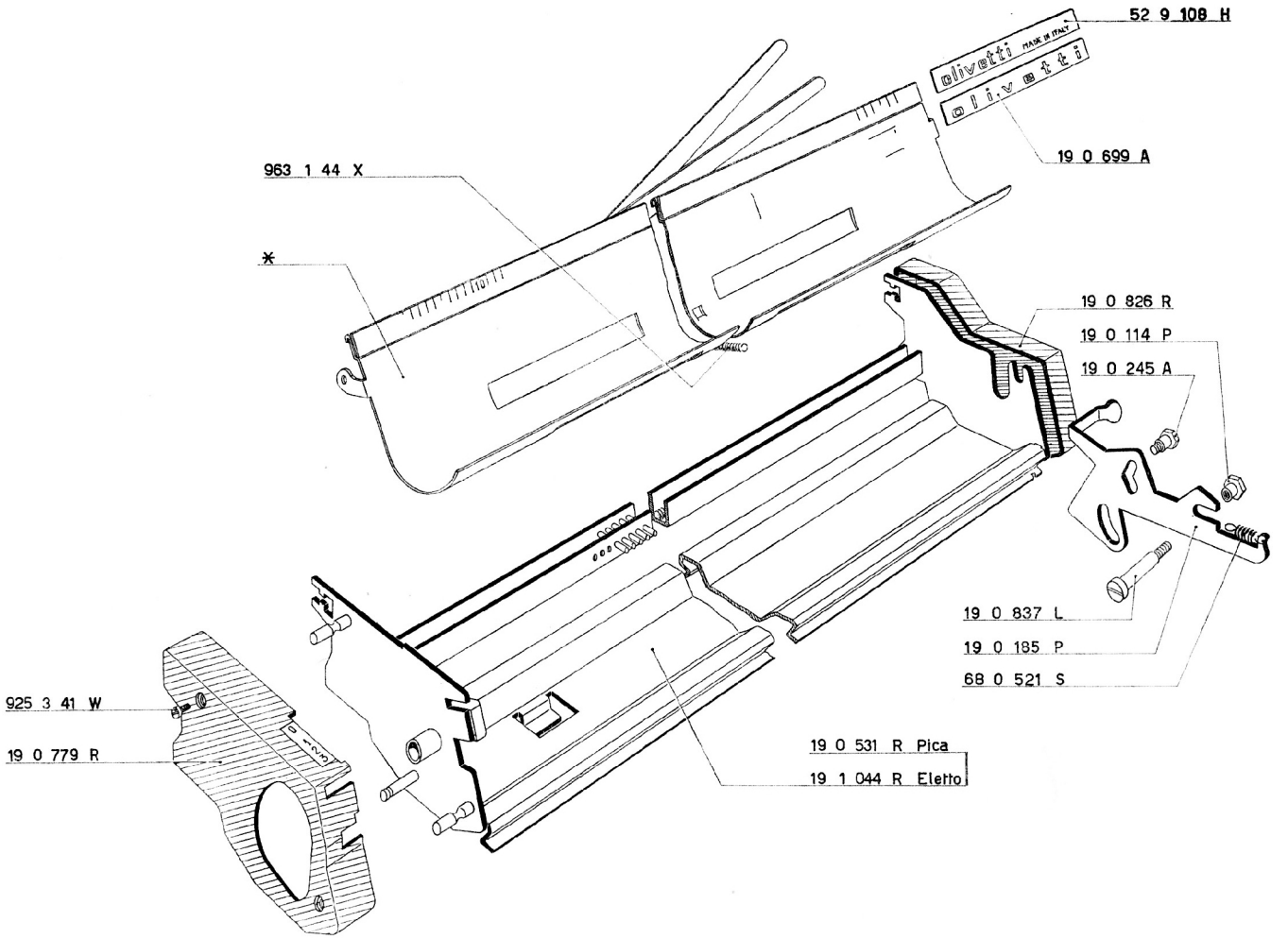
Parts Catalog: Main Spring and Outer Carriage



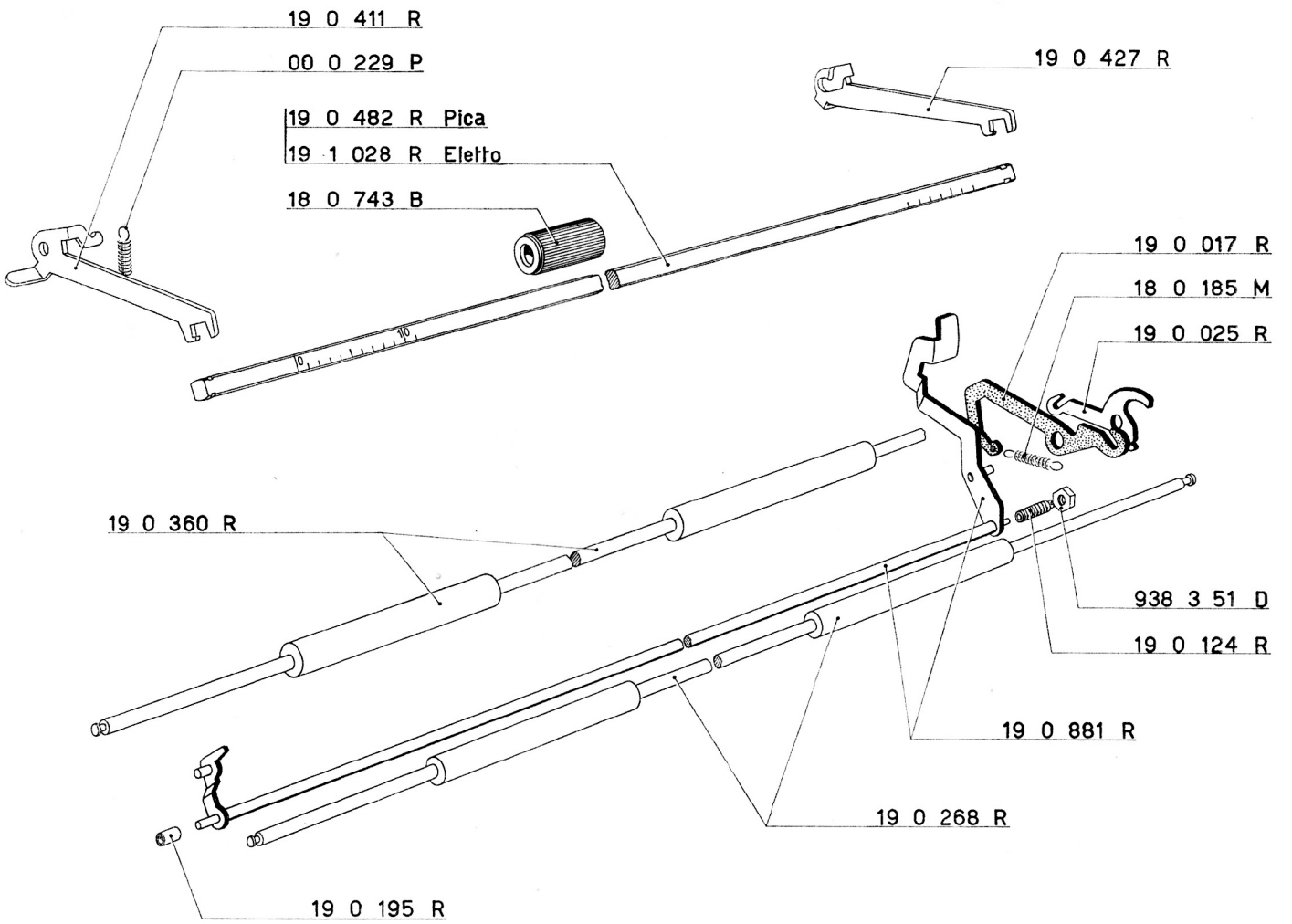
Parts Catalog: Bell, Line Lock and Margin Release



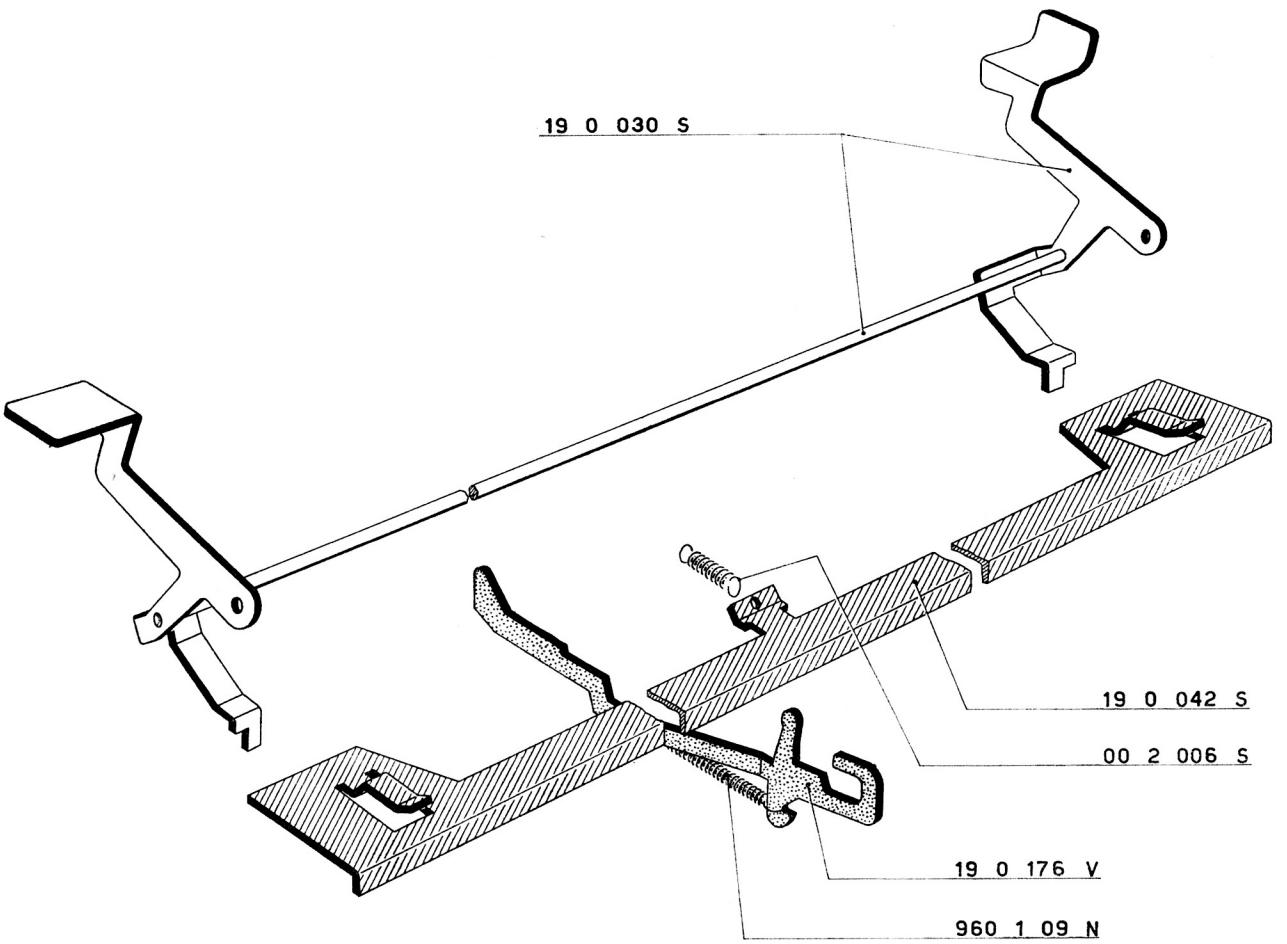
Parts Catalog: Inner Carriage and Paper Feed



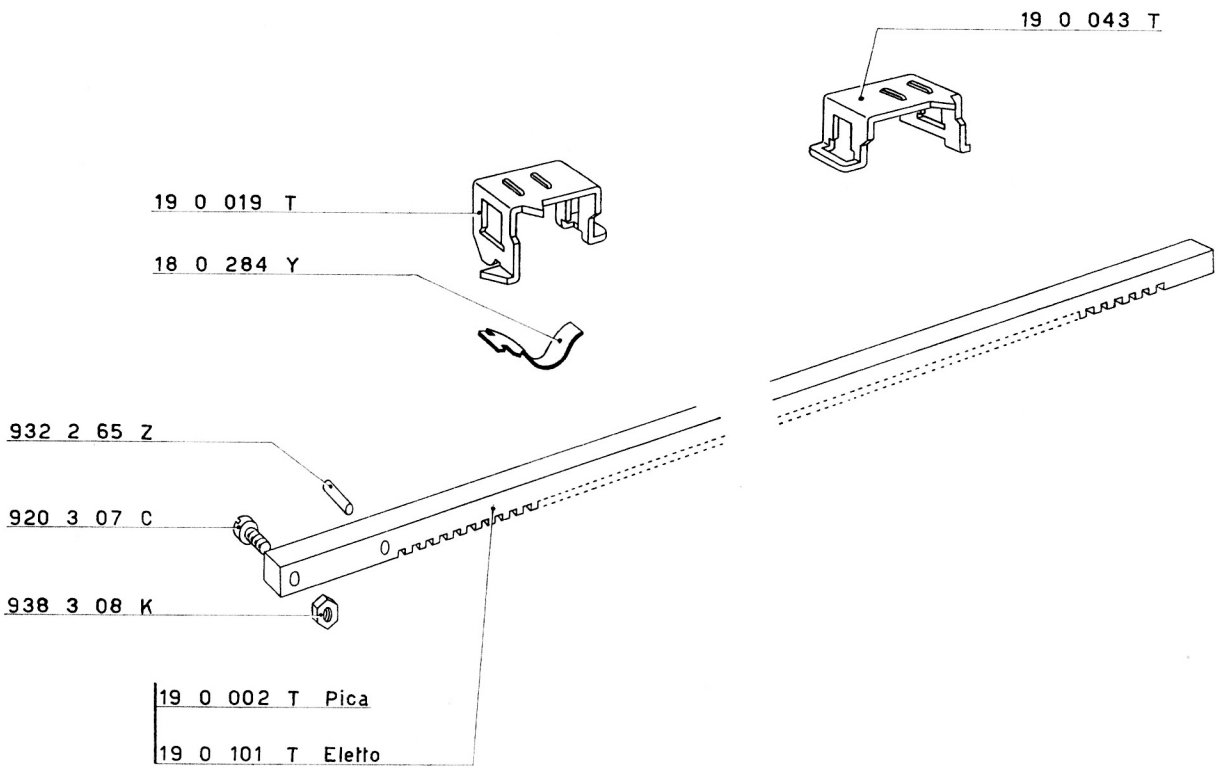
	*	
	Spacing	
	2,23 mm.	2,6 mm.
Light-blue	19 1 052 R	19 0 834 R
Green	19 1 198 R	19 1 175 R
Diaspron colour	19 1 311 R	19 1 294 R
Red	19 1 438 R	19 1 410 R


19 0 411 R
00 0 229 P
19 0 482 R Pica
19 1 028 R Eletto
18 0 743 B
19 0 427 R
19 0 017 R
18 0 185 M
19 0 025 R
19 0 360 R
938 3 51 D
19 0 124 R
19 0 881 R
19 0 268 R
19 0 195 R

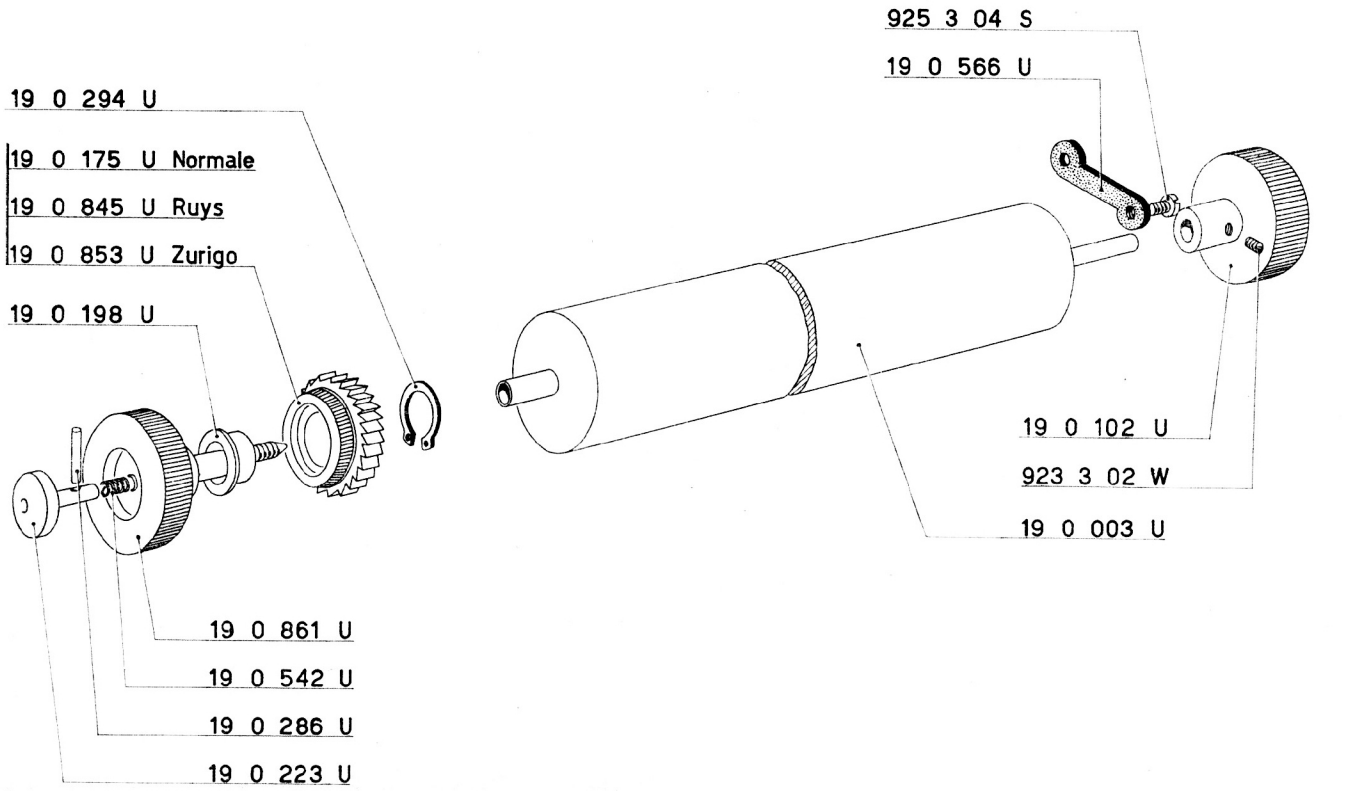
Parts Catalog: Carriage Release

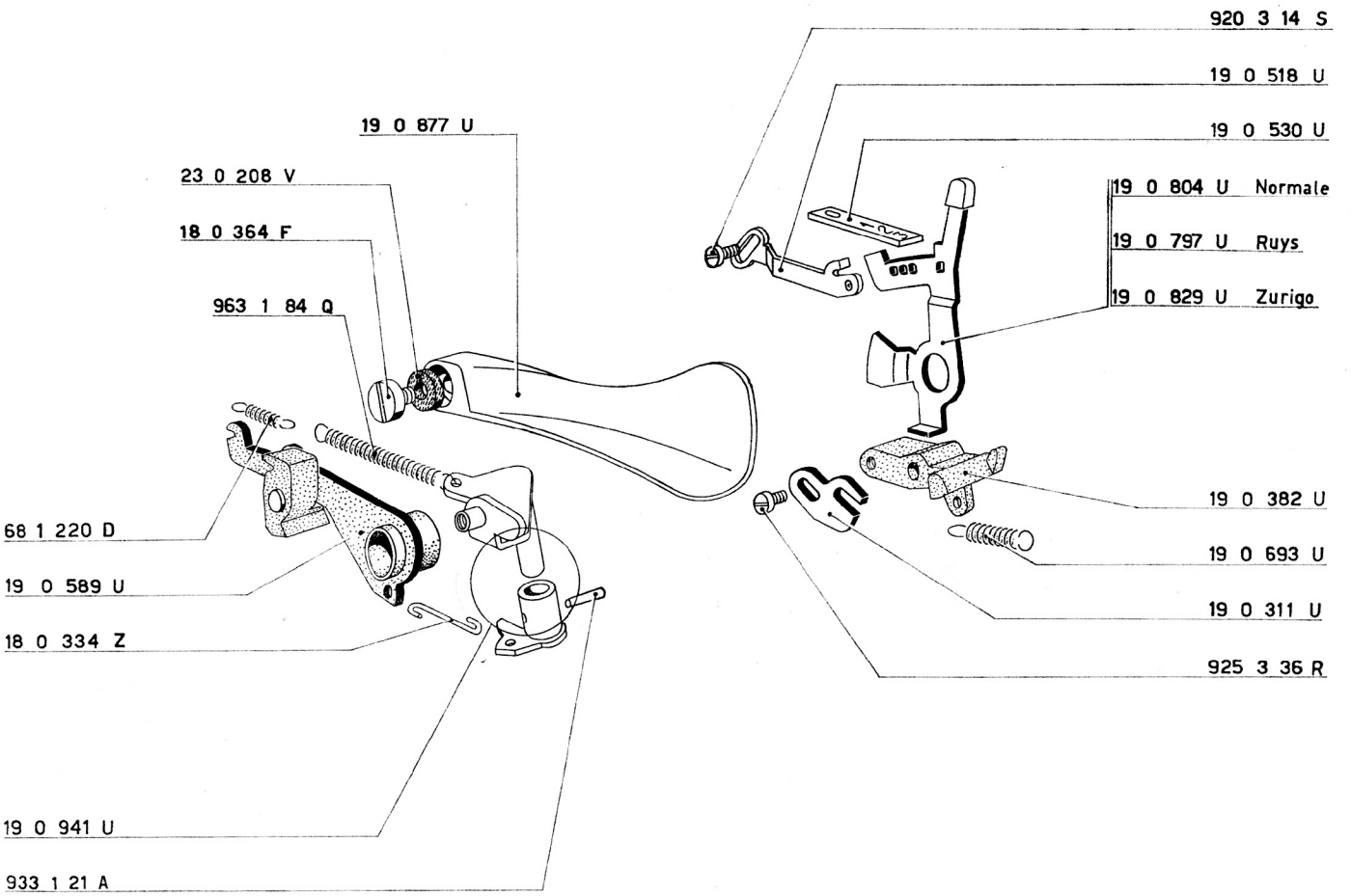


Parts Catalog: Margin Stop

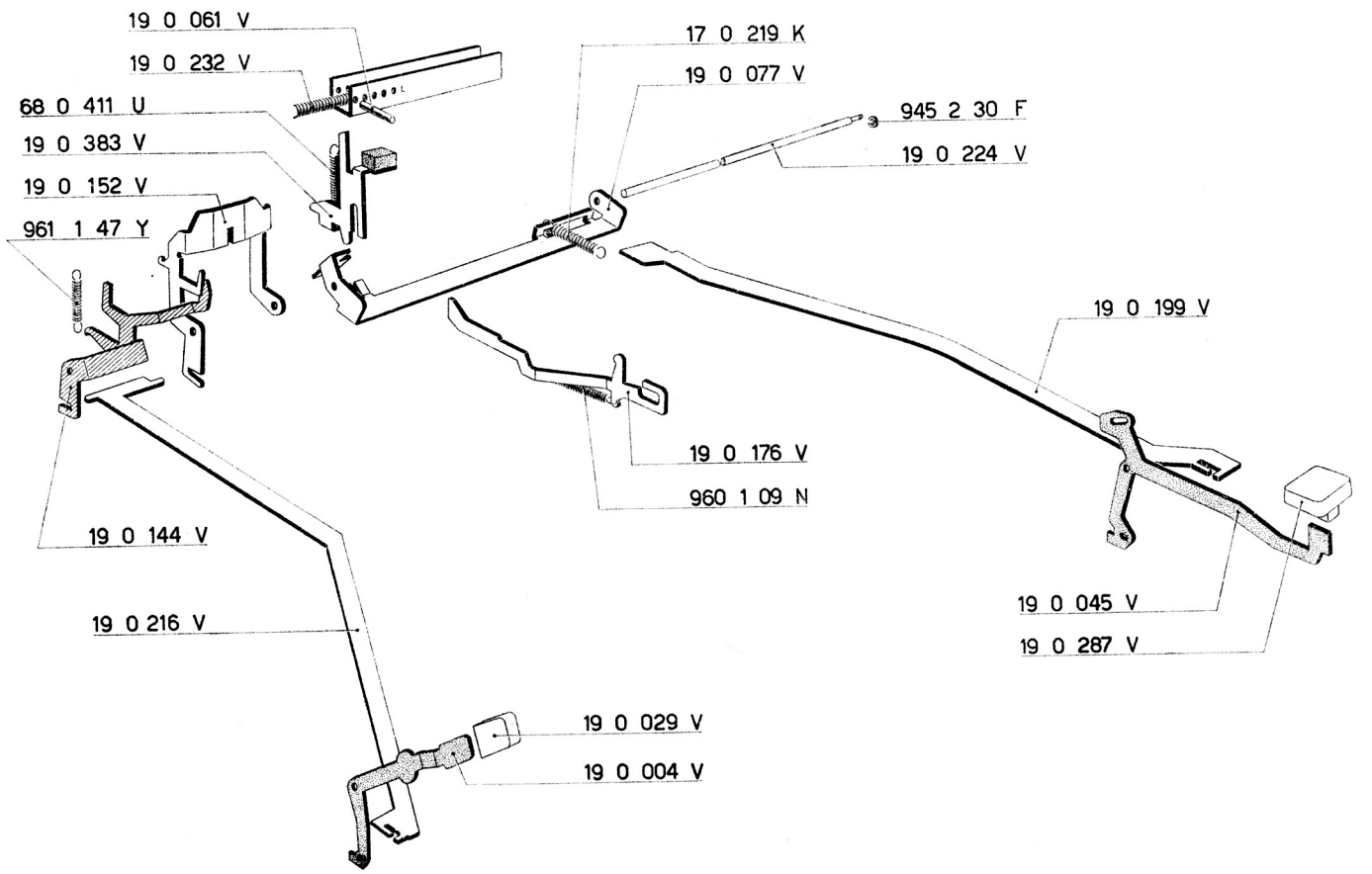


Parts Catalog: Platen, Clutch, Knobs and Line Spacing





Parts Catalog: Tabulator



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STUDIO 44

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TYPE AND SPACING

Number or Symbol	Designation of type	Printing pitch	Number of spaces
0	Modern Pica	2.6	90
1	Pica		
5	Medium Roman Italie		
8	Russian Pica		
41	Pica Double Gothic		
41 bis	Shorthand		
50	Greek		
51	Medium roman		
56	Hindustani		
64	Pica Italic		
69	Hebrew		
101	Large pica		
153	Double Gothic pin point		
218	Small Pica Double Gothic		
290	Pica Single Gothic and pin point		
336	Bulgarian latin		
I. C.	Pica Single Gothic		
7	Elite	2.23	105
76	Elite Italic		
84	Elite Book		
213	Elite Double Gothic		
507	Greek Elite		

LINE SPACING

Name	Line space in mm.				Number of teeth on wheel
9.5 LINE SPACING	4.75	7.125	9.5	11.875	54
STANDARD	5	7.5	10	12.5	52
ZURICH 1	4.53	6.8	9.07	11.34	57
ENGLISH	4.25	8.5	12.75	—	61
Ruys'	4.25	6.37	8.5	12.75	61

1 — Shift key
2 — Shift lock key
3 — Setting and clearing lever for tabulator stops
4 — Margin release key
5 — Touch control (protected by movable cover)
6 — Line spacing lever
7 — Carriage lock lever
8 — Clutch knob
9 — Line spacing selector lever
10 — Carriage release levers
11 — Sliding paper guide
12 — Margin block
13 — Folding paper supports
14 — Bail rod frame
15 — Line finder indicator
16 — Paper release lever
17 — Two-colour and stencil lever
18 — Back space key
19 — Single tabulator key
20 — Space bar

Line spacing.

Line space lever 6 folds back when the machine is to be put into its case.

The position of the small line spacing selector lever 9 determines the distance between the lines of typescript (line spacing). It has four positions in addition to position 0.

Position 0 releases the platen from the line spacing mechanism to enable writing between the lines of typescript and then returning to the previous line spacing.

Clutch.

This enables typing to be commenced at the desired height on the page, corrections to be made or words added between lines after the sheet has been taken out of the machine. If the sheet is still in the machine, it is more convenient to use the zero line spacing with which it is possible to return automatically to the previous spacing.

Paper supports

Paper supports 13 are lifted up during typing.

Margin setters and margin release key.

Light pressure of the fingers moves the two margin setters 12 along their own graduated bar to adjust the length of the typewritten lines as desired.

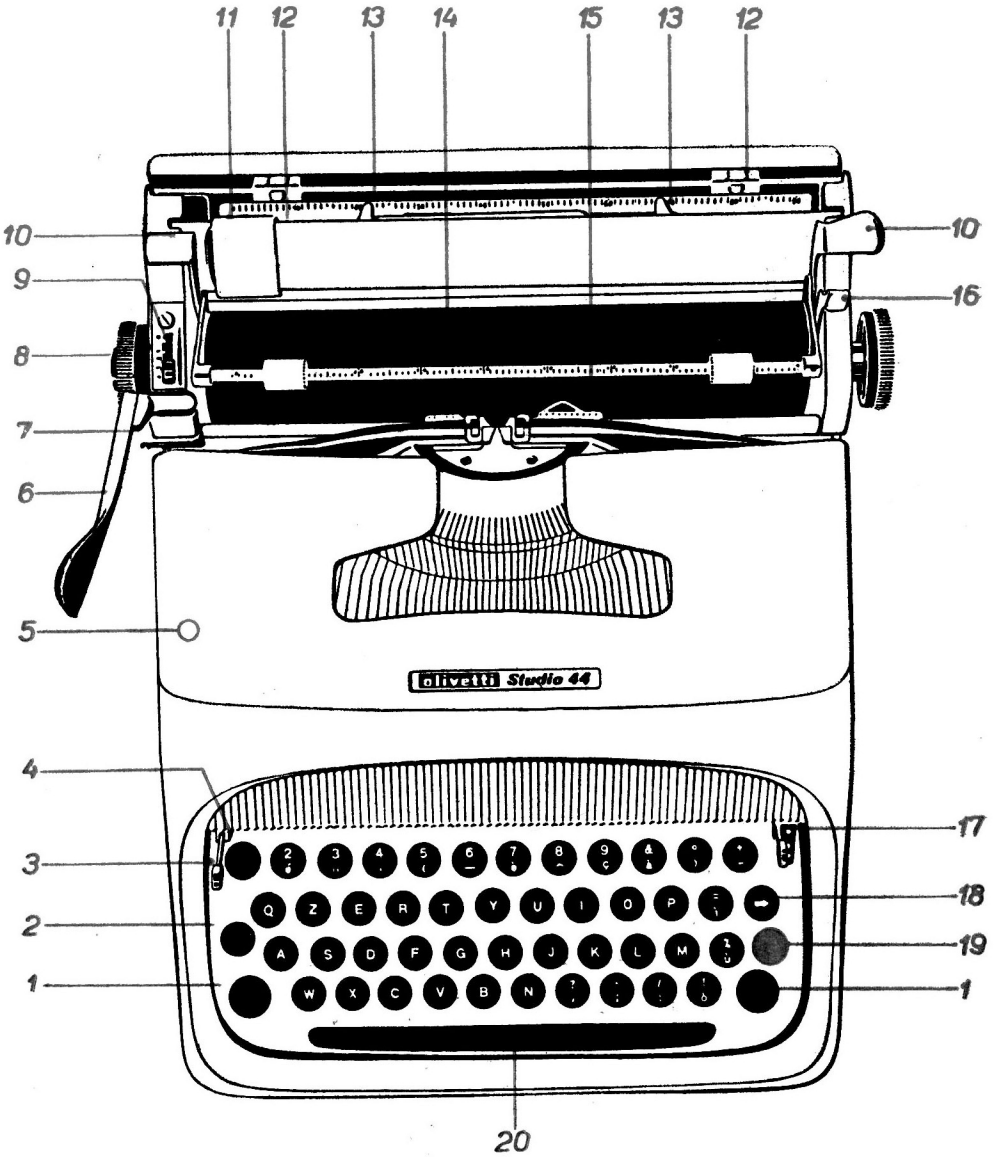
By means of the margin release key 4 it is possible for:

— typing to be continued past the right hand margin;

— the left hand margin to be passed on the carriage return;

— indentation to be obtained automatically.

It is only necessary to press this key during the return of the carriage and the typing line will start some spaces from the left hand margin.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olivetti Studio 44
4
3
2
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17
18
19
1
20

Ribbon reverse and two-colour.

The ribbon reverse is automatic. To reverse it by hand, push the fork which is near the ribbon spool, towards the centre with the finger. The two-colour and stencil lever 17 serves for writing both in black and in red. The middle position (white disc), called the " neutral " position, puts the ribbon out of action when it is desired to cut stencils. It is necessary to take due precautions in case some of the substances with which stencils are sometimes impregnated are injurious to the platen.

Touch control.

The touch can be regulated by adjusting the small lever 5 which is to be found under the movable cover.

Position 1 is for the lightest touch and position 4 for the heaviest.

Single tabulator.

This enables words or figures to be aligned in vertical columns. To use it, any stops that were previously set should be cleared by running the carriage its full length whilst small lever 3 is held back.

To set the tabulator stops, the carriage should be run to the point desired and the small lever 3 pushed forward. On striking tabulator key 19, the carriage comes to rest on the first stop thus set. After typing, key 19 is struck again and the carriage will travel on to the second stop. To clear an individual stop, strike key 19 so that the carriage stops against it and at the same time push the small lever 3 backwards.

Bail rod frame.

The bail rod frame 14 can be folded back. It is fitted with graduated bar and two slidin rollers.

Line finder indicator.

The line finder indicator 15 is graduated and provided with a triangular window so that horizontal and vertical lines can be drawn with a pencil.

Paper release lever.

Operating the paper release lever 16 causes the paper feed rollers to move away from the platen. It is therefore possible to insert several sheets with the necessary carbon paper.

Carriage lock lever.

The carriage lock lever 7 is used when the machine is being carried. The carriage thus remains locked and does not rest on the movable tooth of the escapement.

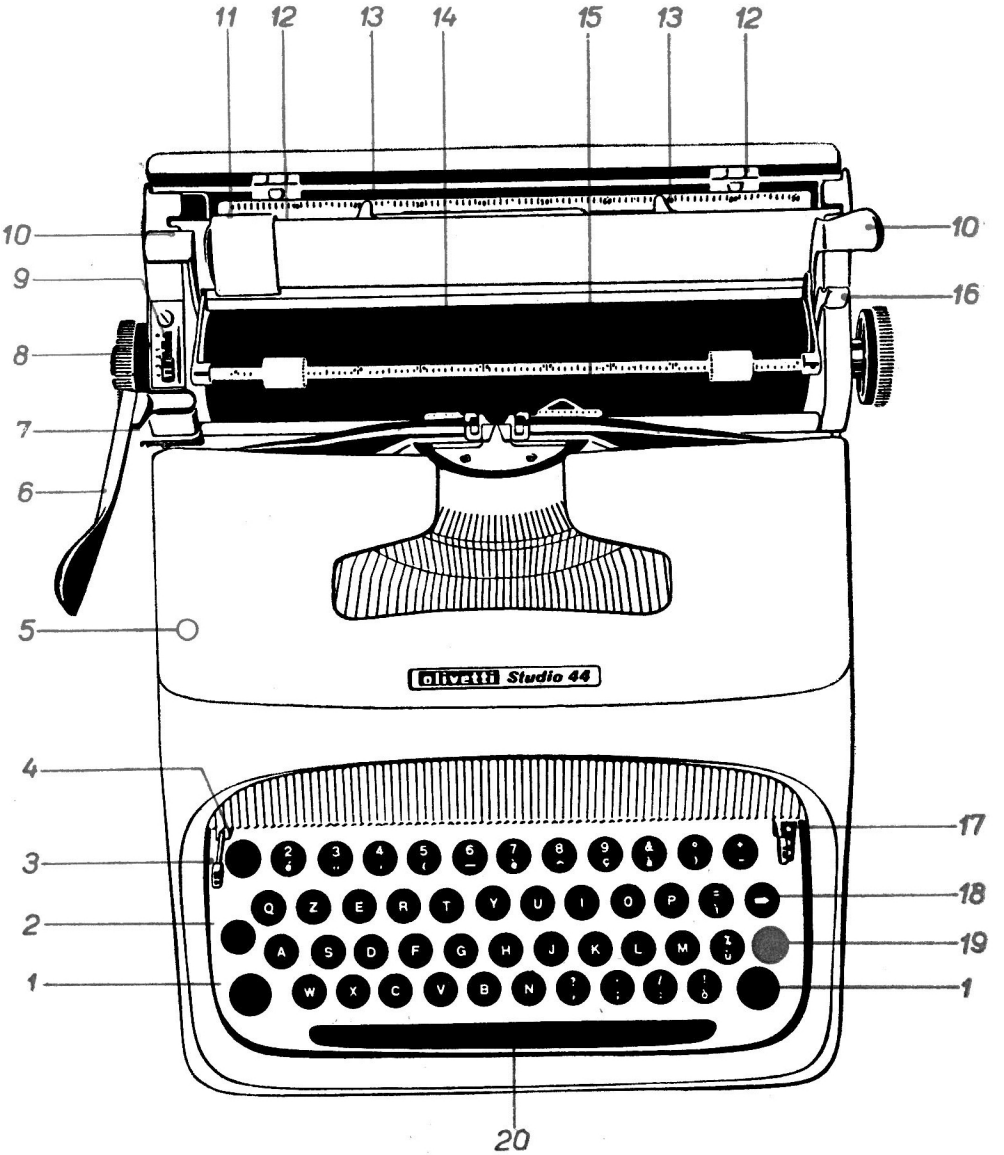
Movable segment.

The movable segment is provided with an anti-recoil device which locks it in the position for typing with small letters.

Technical data.

Weight of machine	6.850 kg.
Height	145 mm.
Width	330 mm.
Lenght	390 mm.
Diameter of platen	41.2 mm.
Maximum width of paper	248 mm.
Length of typed line	234 mm.
Number of spaces:	
2.6 mm. pitch	90
2.23 mm. pitch	105

Line spacing: 9.5 - Standard - Ruys' - English - Zurich 1
Spacing: 2.23 mm. - 2.6 mm.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olivetti Studio 44
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Operation

Right and left are as they would appear on the machine when looking at it from a position facing the front of the machine.

Front and back of machine are where keyboard and carriage, respectively, are situated.

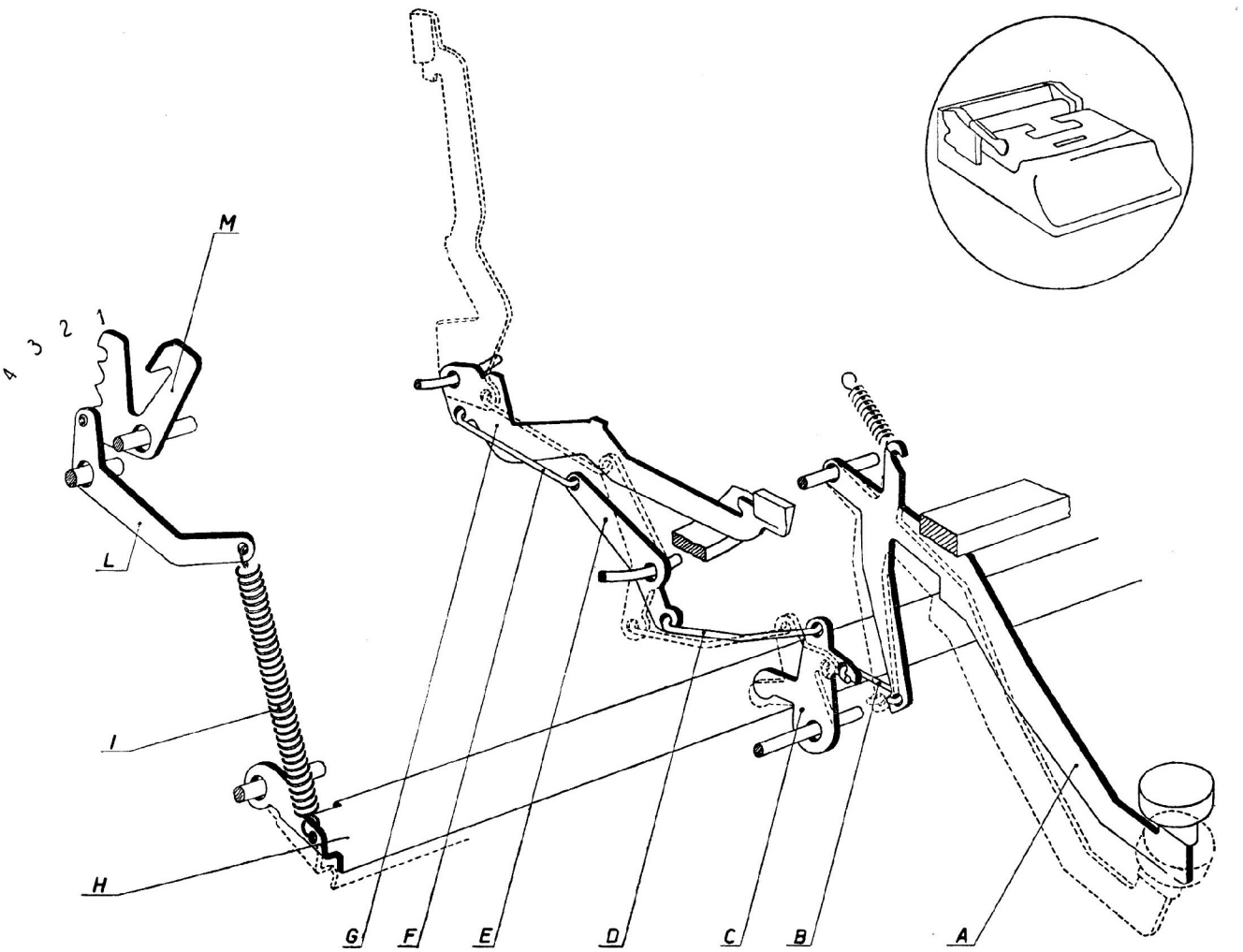
The full lines indicate parts in their position of rest, and the dotted lines show the positions reached at the end of their movement.

Cinematic and touch control.

When a key is lowered, the corresponding lever **A**, through link **B**, moves the first movement lever **C** towards the back. Lever **C**, by means of link **D**, causes the second movement lever **E** to turn towards the front. Lever **E**, by means of pull rod **F** raises type bar **G**.

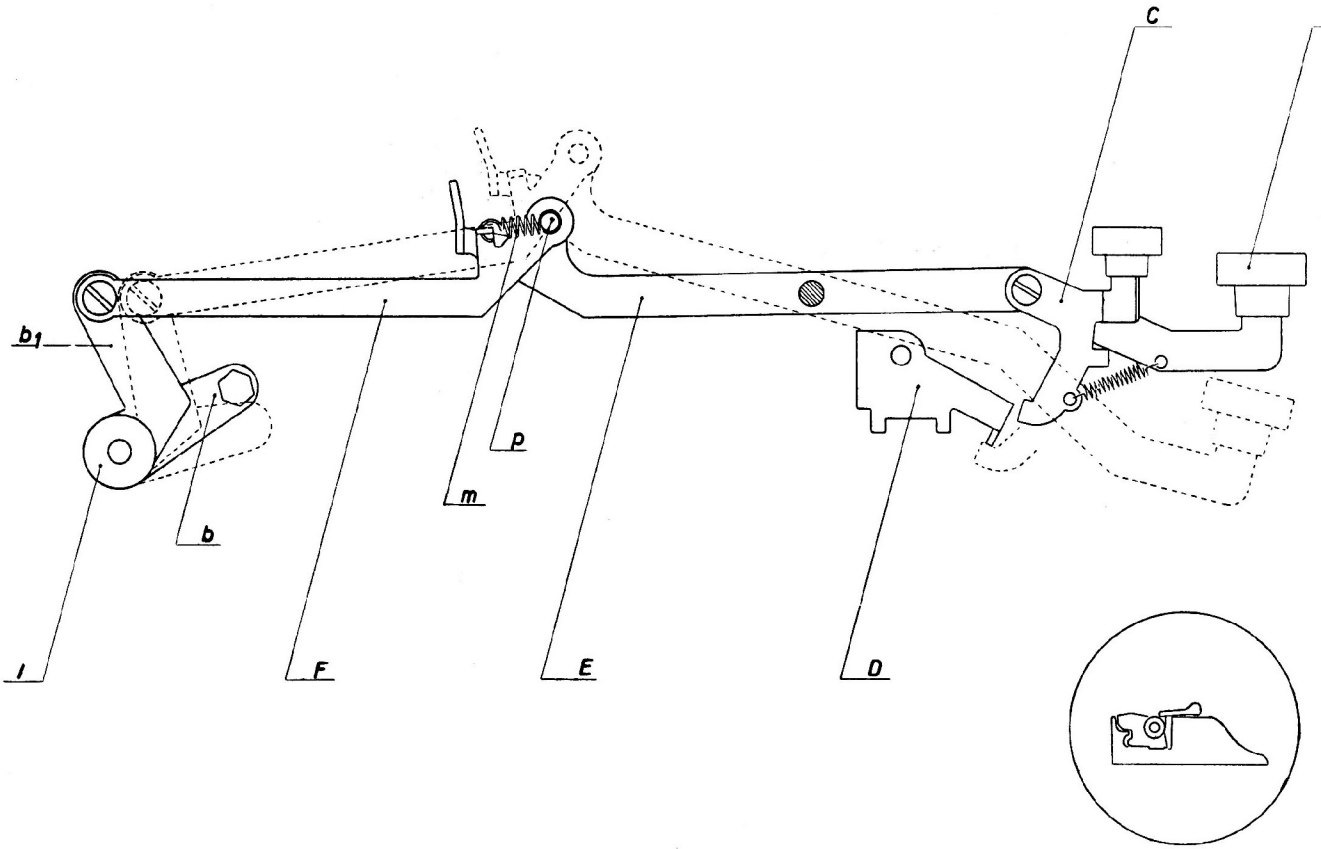
In its backward rotation, first movement lever **C** lowers lug **H** of the ribbon movement. The latter, through a mechanism which will be described later, determines the feed and lift of the ribbon.

A certain force, which is dependent on the tension of spring **I**, is required to lower lug **H**. Through lever **M** and corresponding arm **L**, four different tensions can be given to the said spring **I**. The force necessary to lower the keys can thus be varied and the touch adjusted to suit the operator.



Shift movement mechanism.

Lowering shift key **B** causes the rear part of lever **E** to lift. Displacement of lever **E** pulls link **F** causing the shaft with arm **I** to rotate forwards.



Shift mechanism.

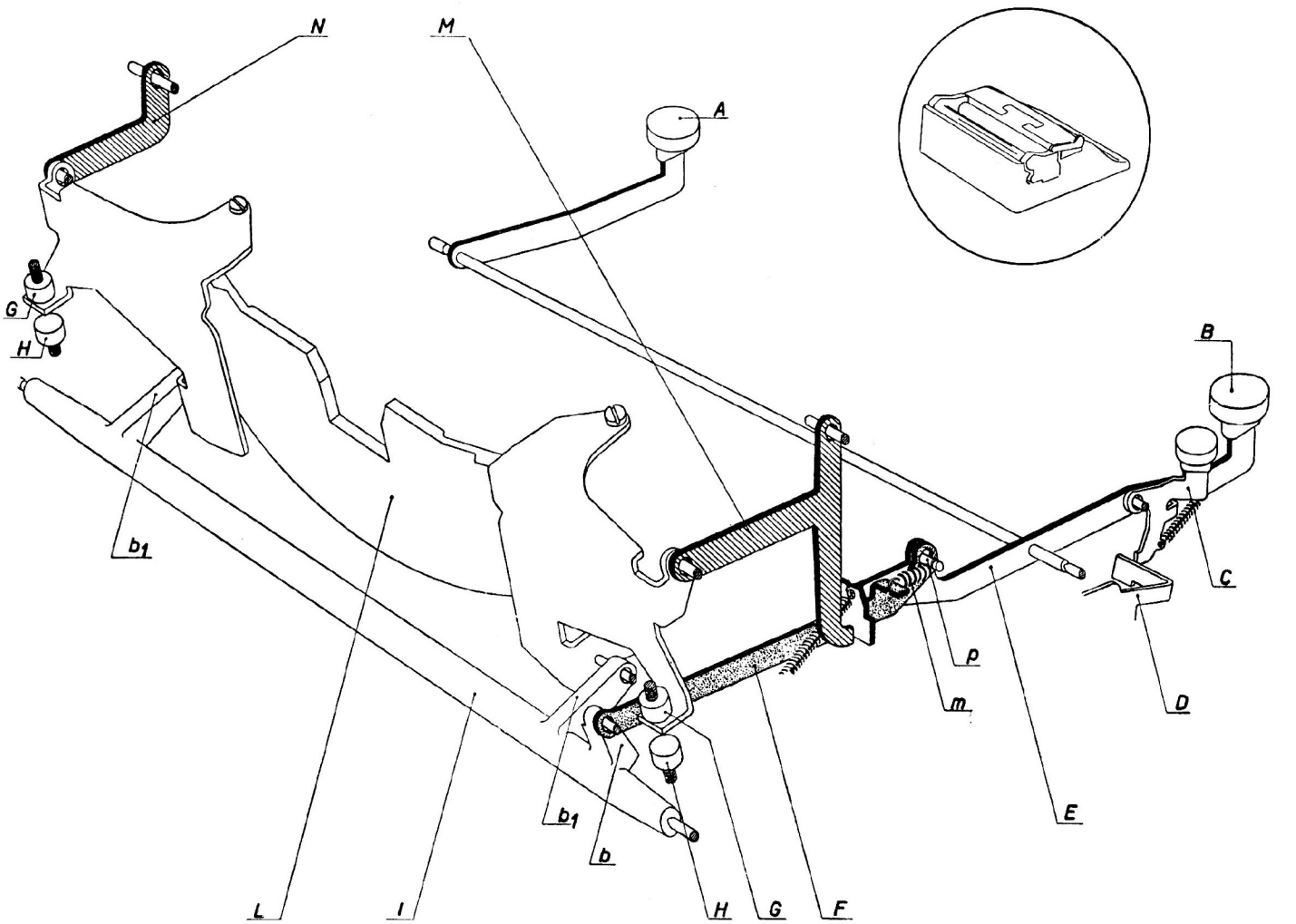
The type-bar segment **L** is pivoted on the two arms **b1** of shaft **I** and is consequently lowered.

The movement of the segment is stopped by regulator **H**, which determines the " capitals " position of the segment itself.

Connection between lever **E** and link **F** is by means of pin **p** which is lodged in the slot of the link itself. Spring **m** is hooked between the latter and lever **F**. This group constitutes the flexible coupling of the shift mechanism chain. When the type bar segment has reached the capitals position and the lowering of one of the two keys **A** or **B** is continued, the flexible coupling is brought into action. Shaft **I** remains steady while pin **p** slides in the slot of link **F**. Almost at the end of the operation, the lever of shift lock **C** can be hooked to the corresponding bracket **D**.

The connecting rod **M**, in addition to guiding the type bar segment, has also the function of locking it in its " small letters " position. In fact, its lower angle intercepts the rear bend of lever **E**.

It is only possible to lower the segment by depressing the shift key: in fact, any attempts made to lower the segment by direct pressure are opposed by blockage caused by intercepting pieces. The segment thus remains locked in its position.



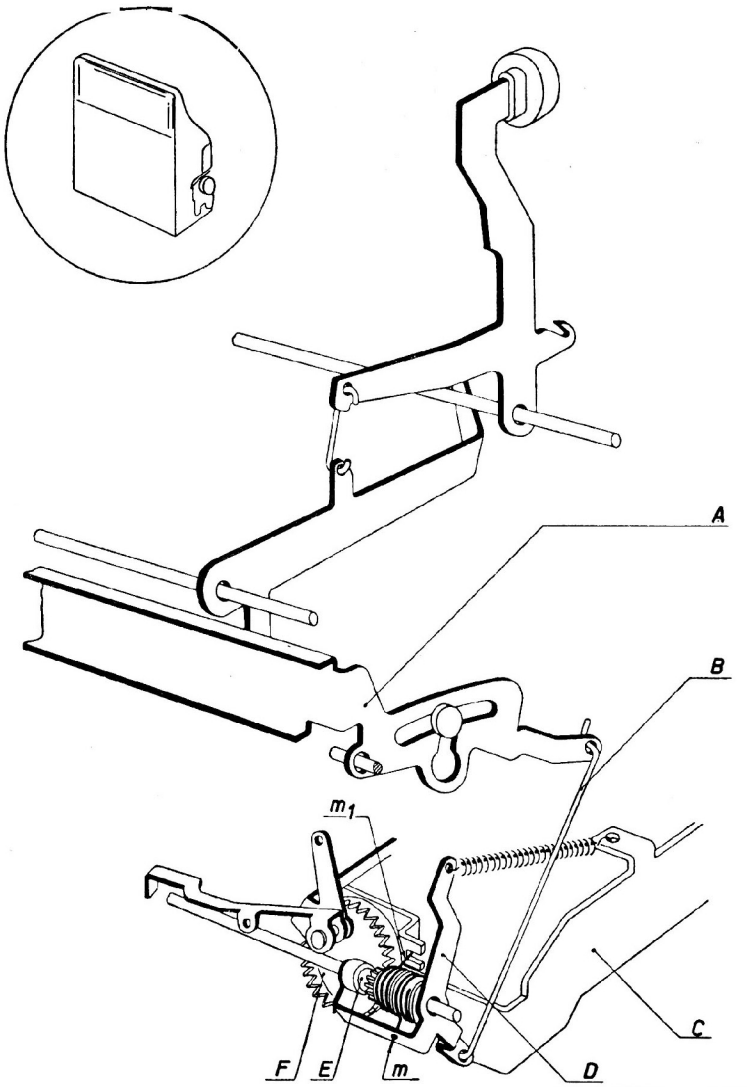
Ribbon feed.

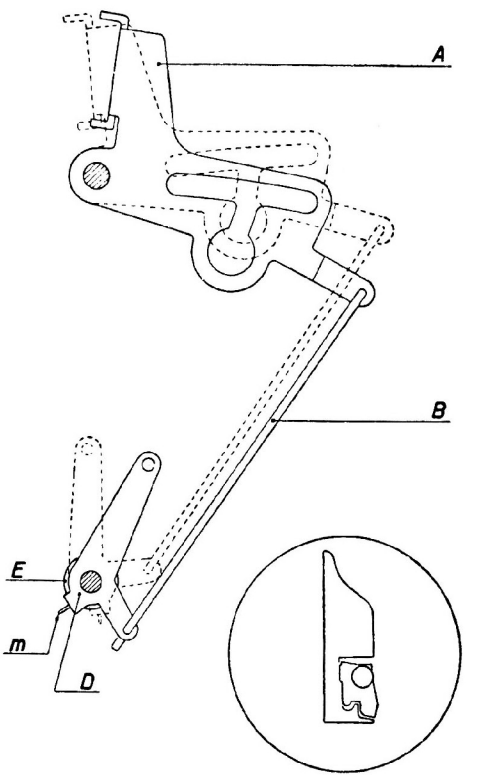
The forward rotation of the ribbon operating lug through pull rod **B** causes frame **D** to turn in the same direction.

With this movement the small spring **m**, which has its spring head inserted in an opening of the frame **D**, tightens on the cylindrical part of pinion **E**, giving it rotation. The small spring **m1**, the head of which is anchored to bracket **C**, tends to stretch and therefore does not oppose any appreciable resistance to movement.

When the frame **D** returns to rest the small spring **m** tends to stretch and the slight dragging action against rotation in the opposite direction given by the pinion is immediately braked by small spring **m1** which tightens and holds pinion **E** steady.

The movement of the pinion itself is therefore always forwards.



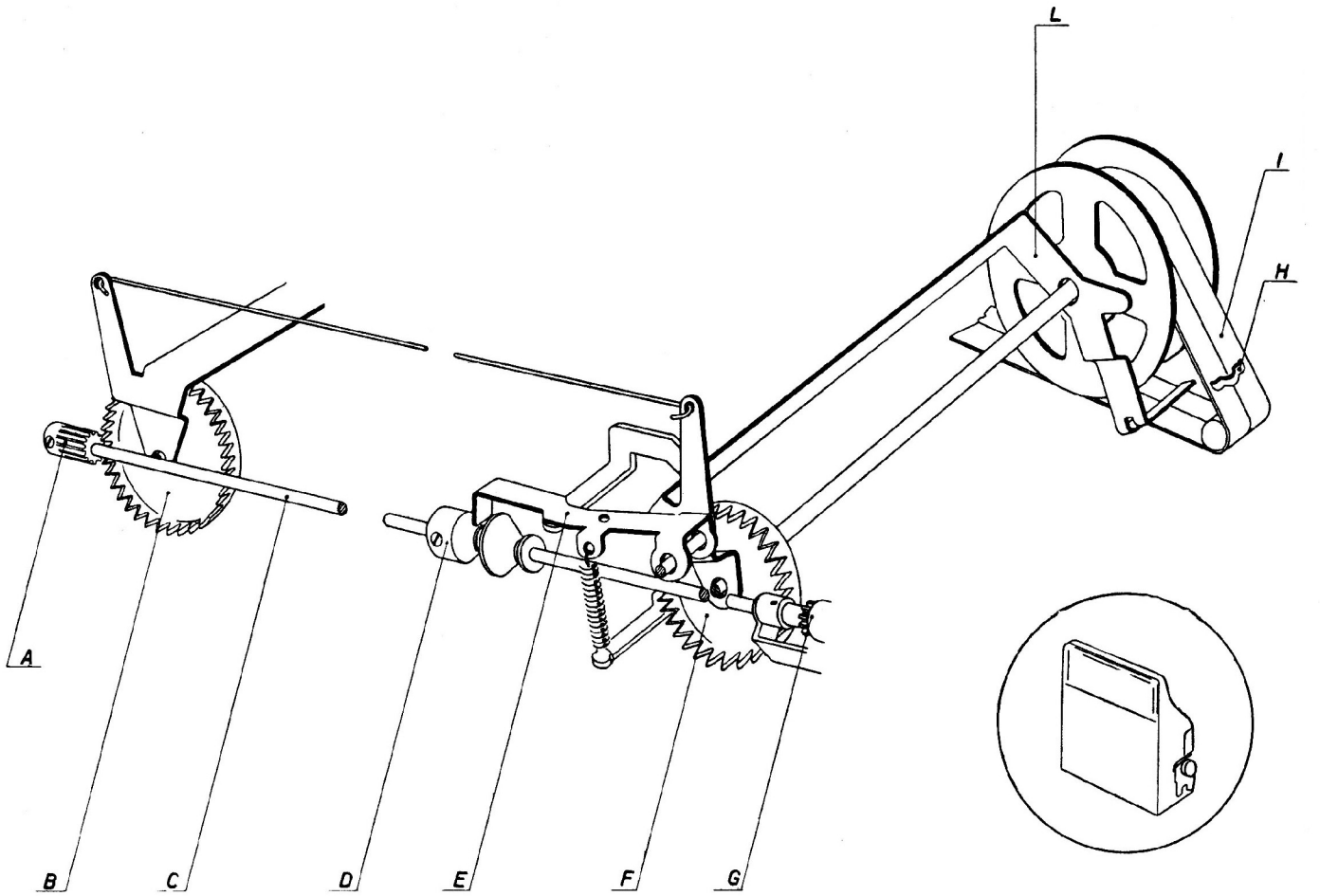


Ribbon reverse.

The ribbon reverse is controlled by two hooks **H** which are attached to the two extremities of the ribbon itself.

The ribbon is pulled by the toothed wheel **B** (which makes the corresponding spool rotate and unwind the ribbon from the other which turns freely in neutral).

Shaft **C** is held in its position by cam **D** and the corresponding positioner **E**.



Reverse movement.

The illustration shown on the preceding page is represented in figure 1, but not in perspective.

Continuing the advance of the feed, the ribbon **I** carries hook **H** to strike against lug **L** which drags positioner **E** along in its movement. The latter would, in the normal way, move shaft **C** to the right but this movement is prevented by pinion **G** on the right side of the machine.

Consequently positioner **E** rises along the inclined plane of cam **D**, descending on the next one of the right hand groove.

Shaft **C** is therefore pushed towards the left; pinion **A** disengages from wheel **B** while pinion **G** meshes with wheel **F** (fig. II). The latter causes the other spool to turn and to wind the ribbon back on itself.

fig. I

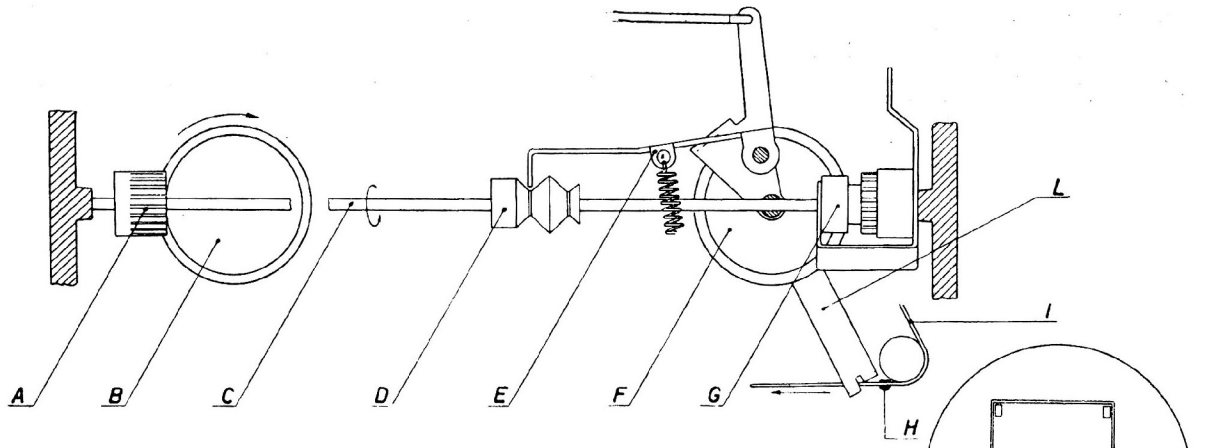
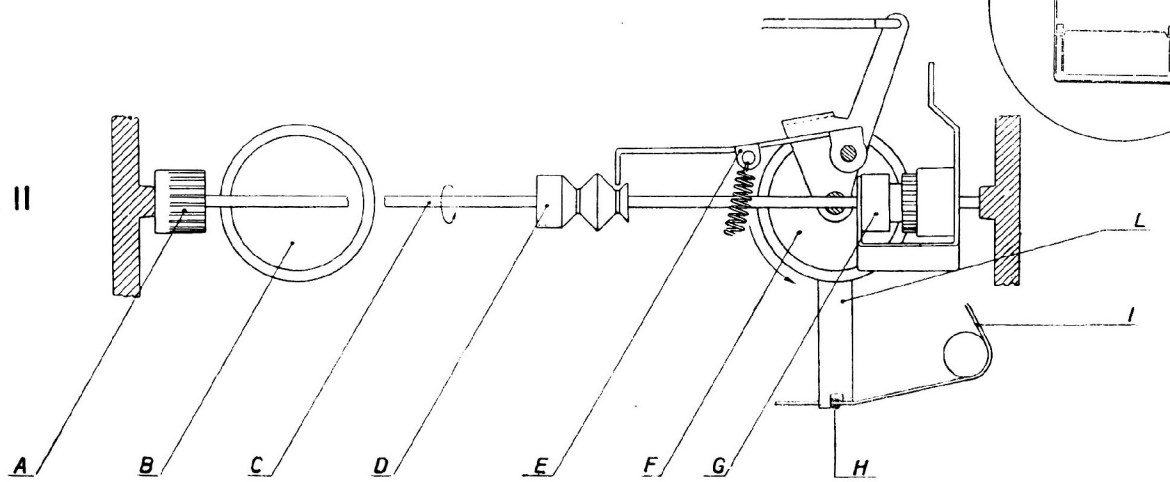


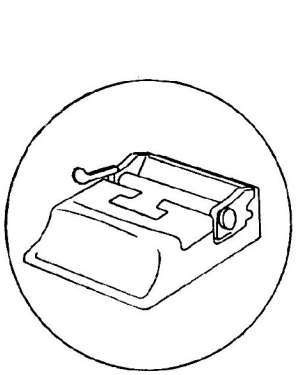
fig. II

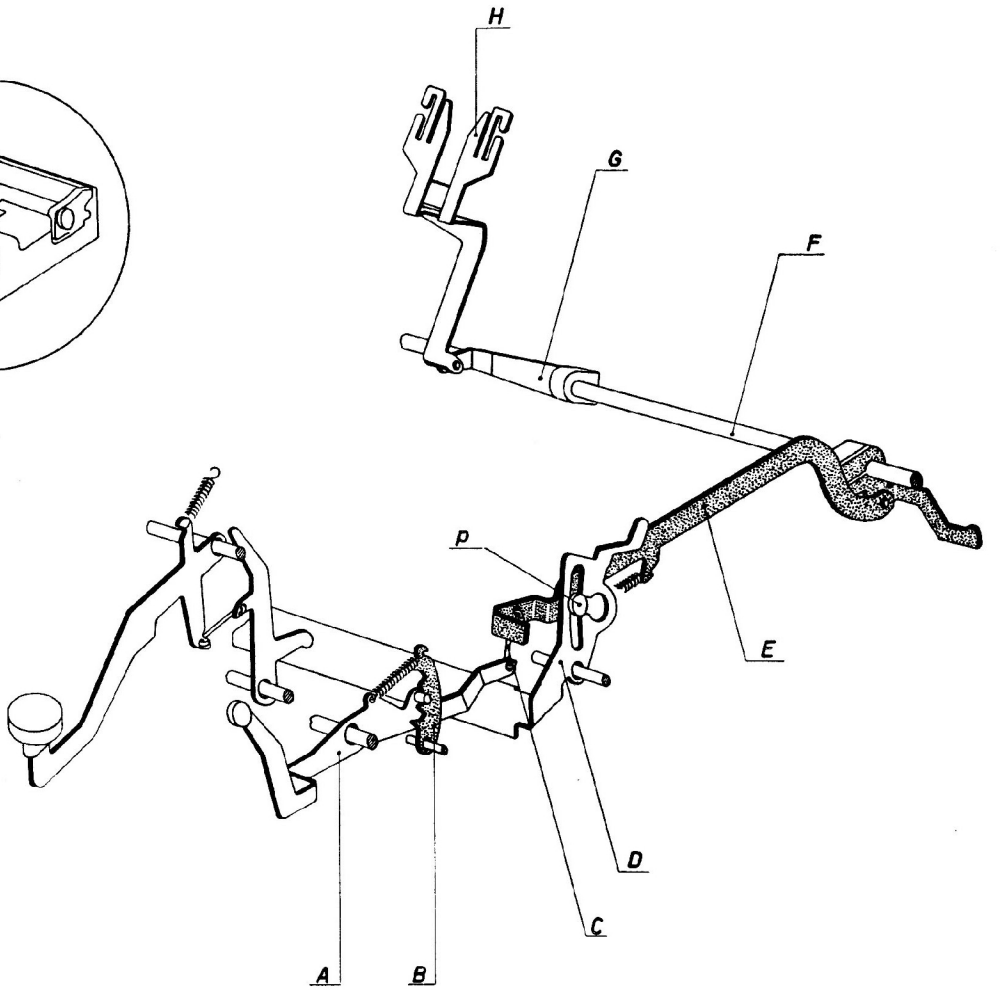


Two-colour - Stencil (neutral) position.

In the illustration the entire two colour mechanism is shown in the neutral position.

In the middle position, the two-colour switch lever **A**, through pull rod **C**, places pin **p** of connecting rod **E** in coincidence with the horizontal slot made in the right side of the ribbon operation lug **D**. When the latter (impelled by a first movement lever) is lowered, it does not, however, drag connecting rod **E** along in its movement because pin **p** merely slides in the horizontal slot of the lug.





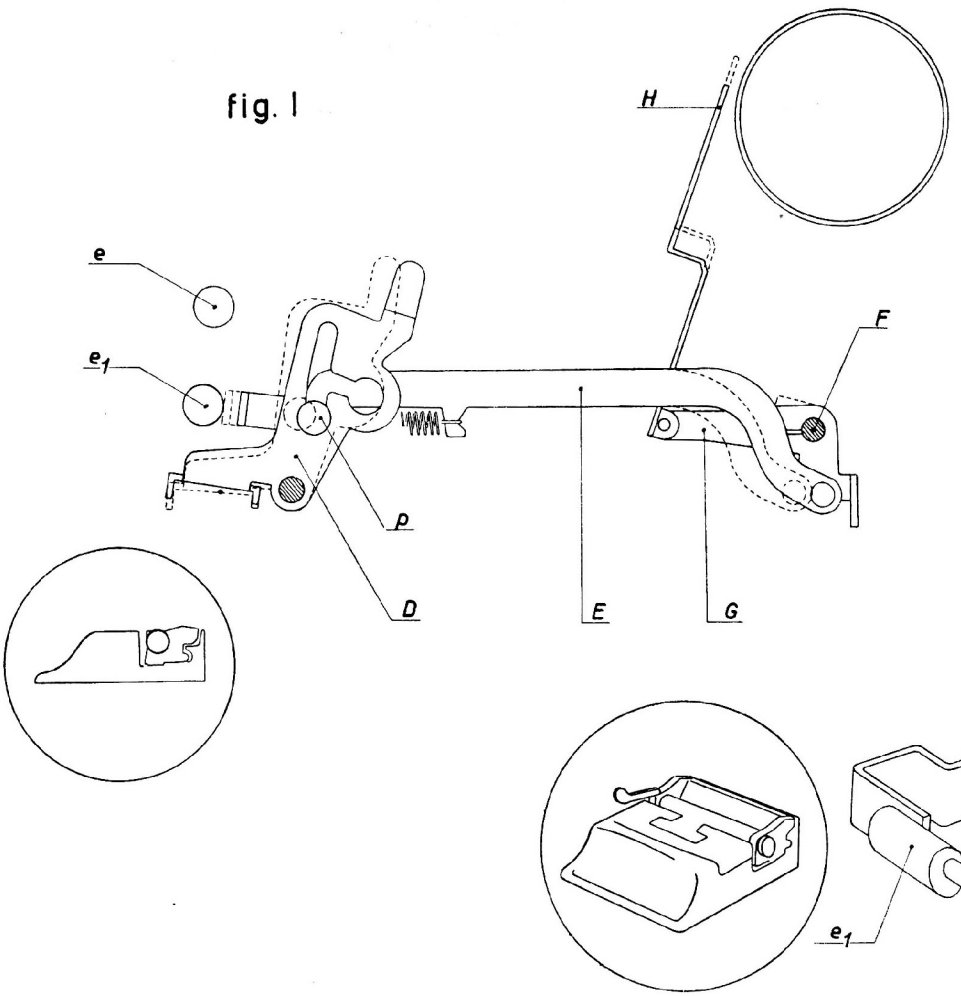
Two-colour - Blue and red positions.

When the two-colour switch lever is pushed upwards (position for blue), pin **p** of lever **E** sets itself into the position shown in figure 1. Lug **D**, as it is lowered, pulls lever **E** which makes shaft **F** rotate causing crank **G** to turn. The latter raises **h** ribbon carrier **H** which brings the ribbon into position for typing in blue. Lever **E** stops against eccentric **e1** (attached to the right side of the machine) and causes the upward movement of the ribbon carrier.

The same movements occur when the two-colour switch lever is placed on red. But this time lever **E** is stopped by eccentric **C**.

When the lever **E** stops against eccentrics **e** or **e1**, the ribbon operating lug **D** has not quite completed its thrust. To overcome this the flexible coupling shown in figure II has been devised. Pin **p** is attached to counter lever **X** which can slide on lever **E**. When the latter is arrested, the lug, continuing its rotation, continues to move pin **p** which slides along the slot of the same lever **E**, at the same time overcoming the resistance of spring **m**.

fig. I



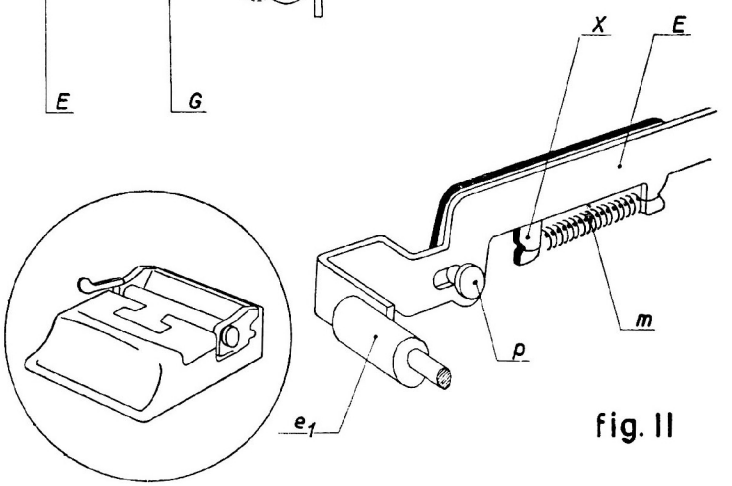


fig. II

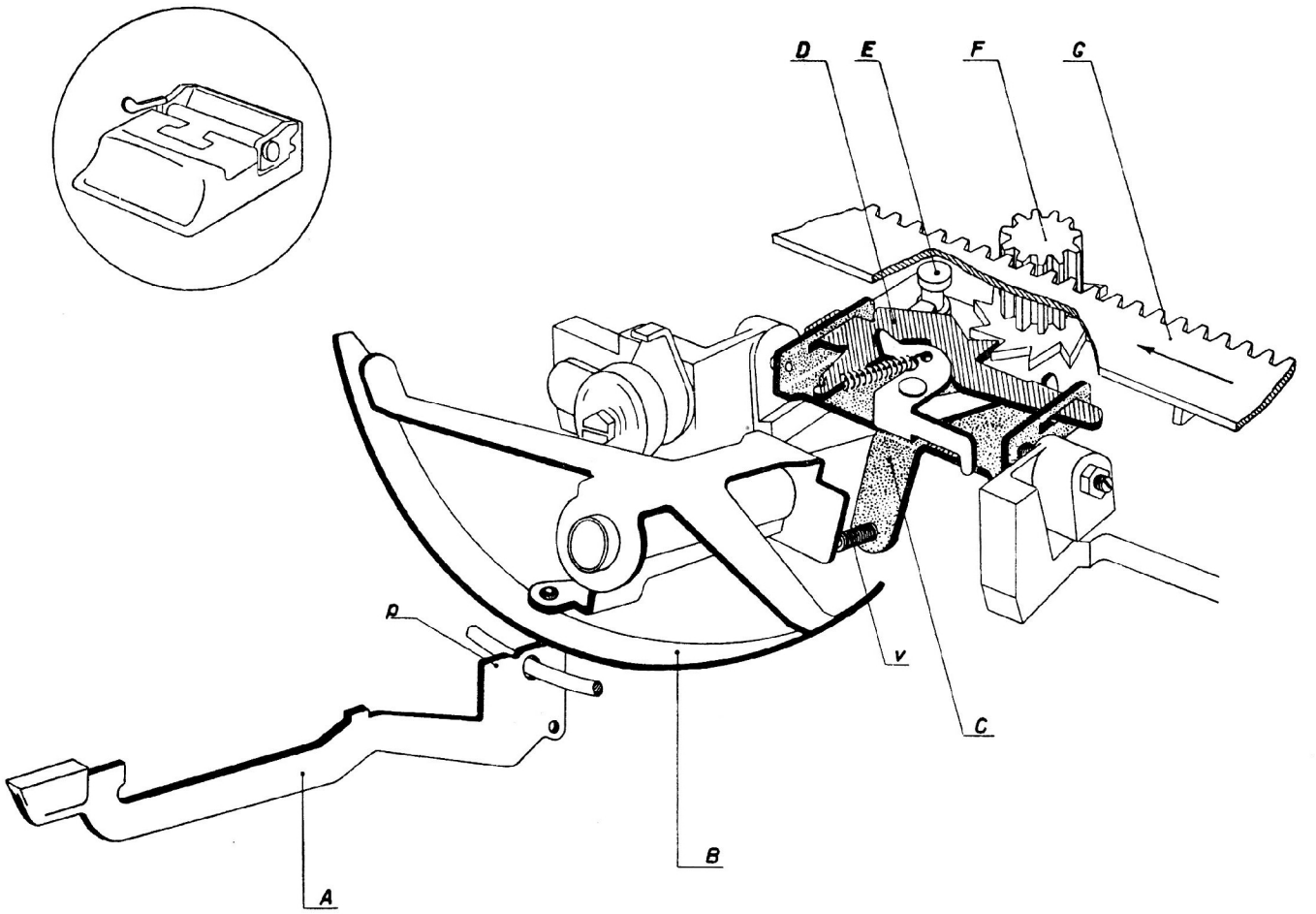
Trip.

Rack **G** fixed to the movable carriage guide is always meshed with the pinion of the escapement wheel **F**.

The movable guide is pulled to the left by the main spring operating through the agency of the carriage draw-wire.

In the rest position movable tooth **D** is meshed with escapement wheel **F** and therefore the carriage is stationary.

When a type bar **A** is raised, its profile **p** pushes against the back of universal frame **B**. This strikes against screw **v** of the rocker **C**, causing it to rise. The movable tooth **D**, following the movement of the rocker **C**, frees itself from the escapement wheel **F**, thus causing the carriage to trip.



Rocker movement.

The complete sequence of the rocker movements will now be explained in detail.

a) When at rest (see figure 1) the rocker **C** is supported on regulator **E**; its fixed tooth is not meshed with the teeth of wheel **F**, but is given a minimum clearance. In figure 1, for the sake of clarity, the movable tooth, which at rest is meshed with wheel **F**, has not been shown;

b) When rocker **C** is raised, the movable tooth frees itself from wheel **F**. The movable guide, pulled by the main carriage spring, moves to the left. Wheel **F**, however, comes into mesh with the fixed tooth (figure II) on which the tooth shown shaded comes to rest.

c) When the rocker **C** returns to rest, the movable tooth which follows its movement, engages the succeeding tooth of the escapement wheel. The carriage has moved one space.

As explained above, the carriage movement of one space takes place in two stages. Contrary to what might be imagined, the printing does not occur between the first and second stage. Actually, since the type-bar travels with a remarkably high speed and operates the universal frame when it is very close to the platen, the printing is accomplished even before the carriage has started to move.

This system guarantees the greatest uniformity in the spacing and speed in the typing.

Silencer.

Figure III shows the operation of the silencer finger **G**. When the carriage moves from left to right the escapement wheel **F** rotates counter-clockwise. The finger is dragged by the movement and keeps movable toothi **D** away from the wheel. Without this provision, movable tooth **D** would bounce from one tcoth of the wheel to the other, producing a continuous metallic sound.

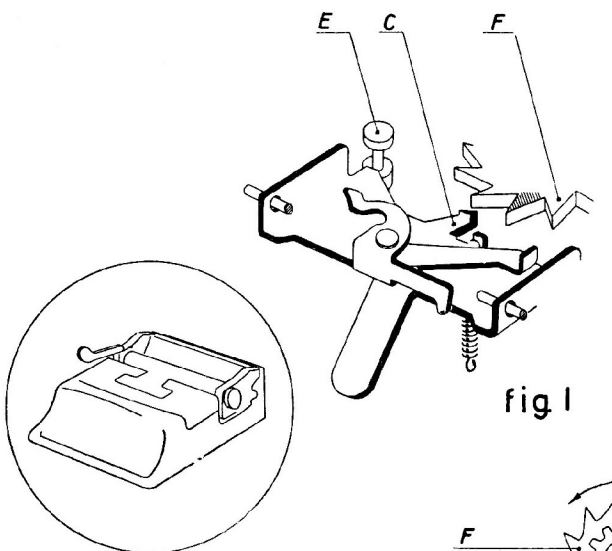


fig. I

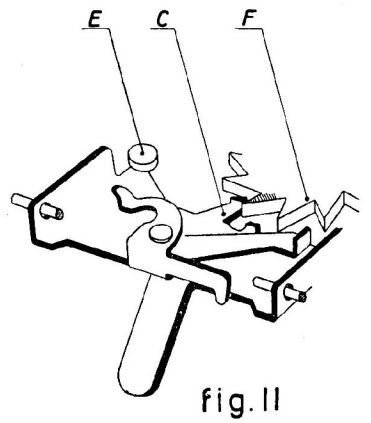


fig. II

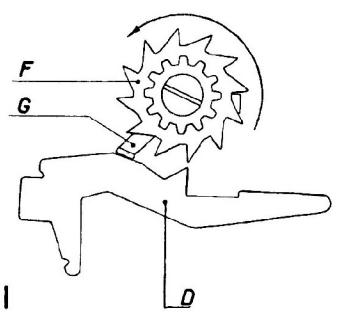
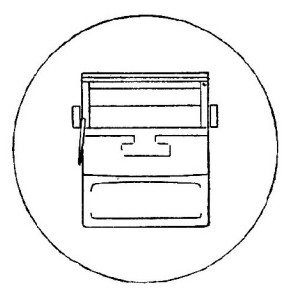


fig. III

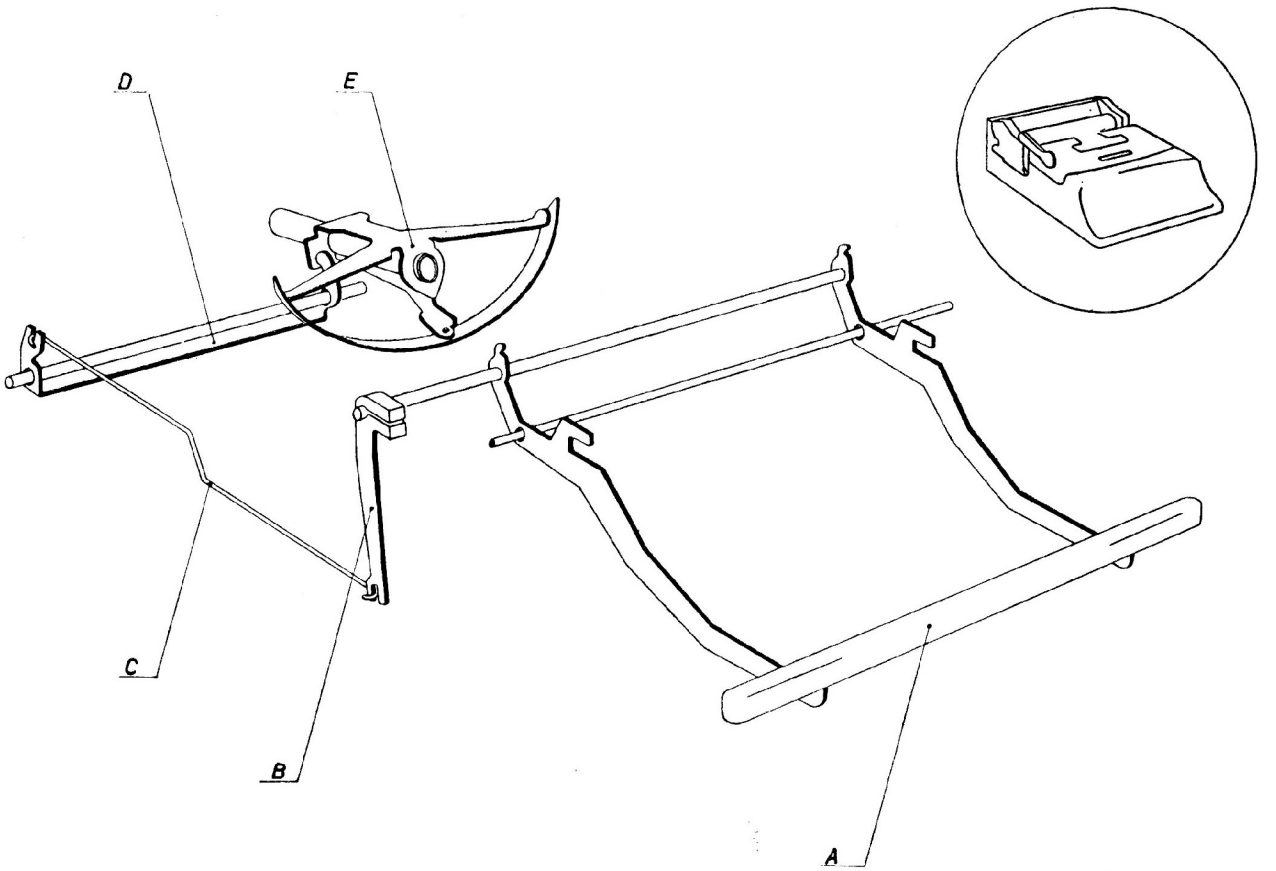


Space bar.

When the space bar **A** is lowered, lever **B** turns and moves link **C** towards the rear of the machine.

This movement is transmitted to frame **D** which presses with its right hand shank against universal frame **E**.

The latter, as previously explained controls the carriage release.



Carriage release.

In the position of rest, and as previously stated, the movable tooth **D** of the escapement is engaged in wheel **E** (figure I).

To enable the carriage to run freely from right to left, one of the two carriage release levers **A** must be lowered.

This transmits the movement of bracket **B** which moves the shank **a** of frame **C**. Shank a_1 of the same frame moves tooth **D** forward, disengaging it from escapement wheel **E** (figure II).

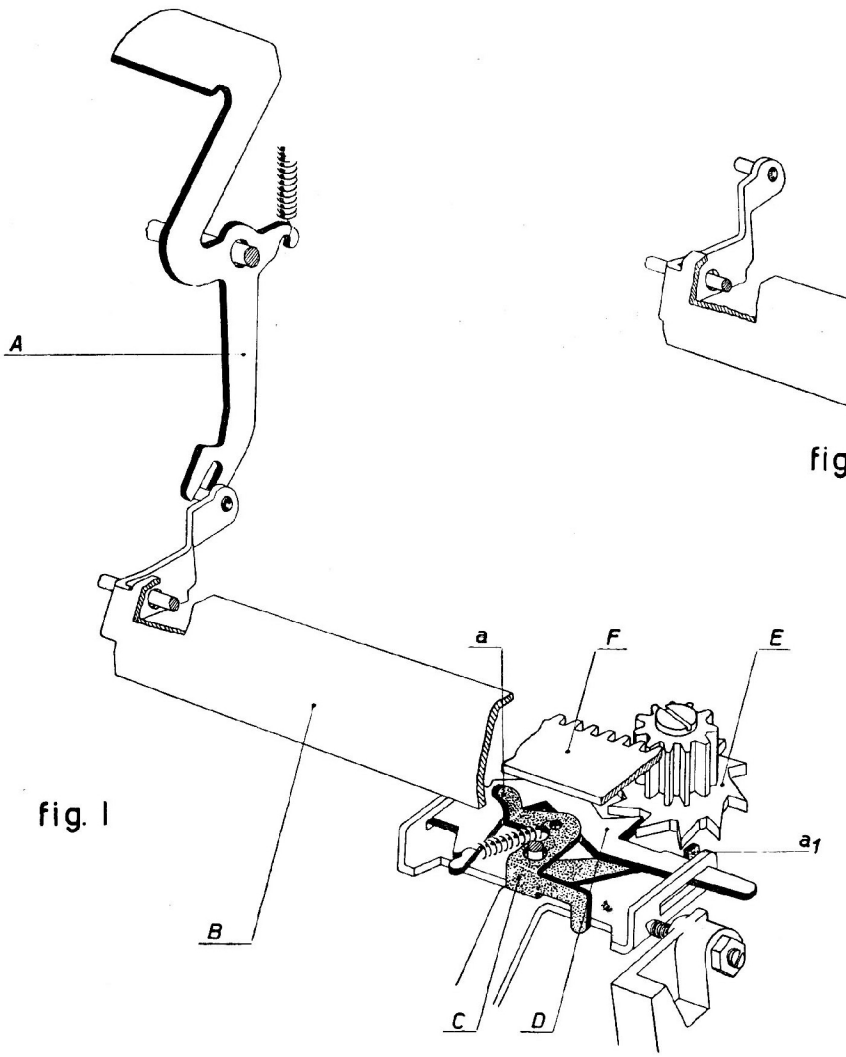


fig. I

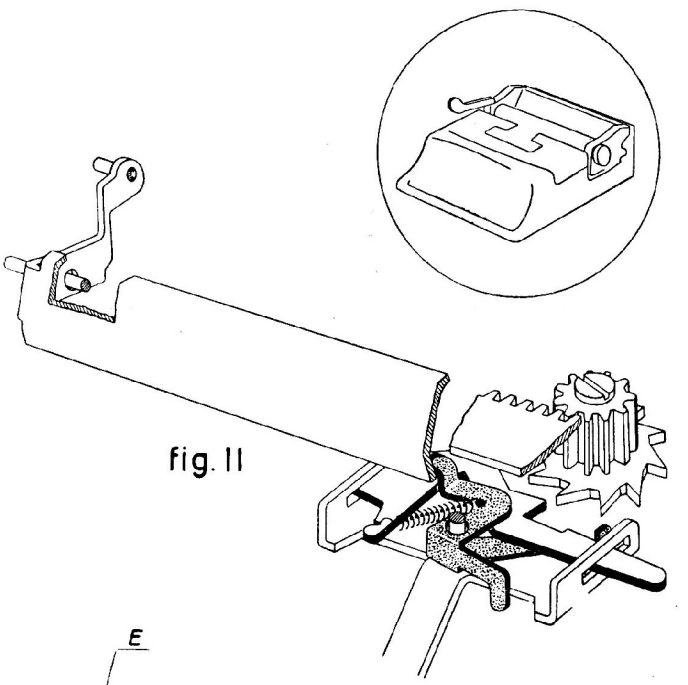


fig. II

Back spacing.

When the back space key is lowered (figure I), the corresponding lever **A**, through link **B**, causes lever **C** to turn and drag pull rod **D** forwards. The latter makes frame **E** rotate counter-clockwise moving pawl **F** to the left. The latter meshes with escapement wheel **G**, causing it to turn backwards one space.

How this movement occurs:

a) When at rest (position in figure II), pawl **F** is clear by a small amount from escapement wheel **G**;

b) In its path to the left, pawl **F** meshes with the shaded tooth of wheel **G**; the latter is consequently forced to rotate counter-clockwise. The movable tooth **X** frees itself from wheel **G** which with one of its teeth drives it towards the front (figure III);

c) As soon as pawl **F** returns to rest, movable tooth **X** is ready to engage the following tooth of wheel **G**. The latter, with the rack, and therefore also the movable guide, is moved backwards one space.

N. B. - The second tooth **d1** of the pawl **F** (figure III) prevents the escapement wheel jumping two spaces instead of one.

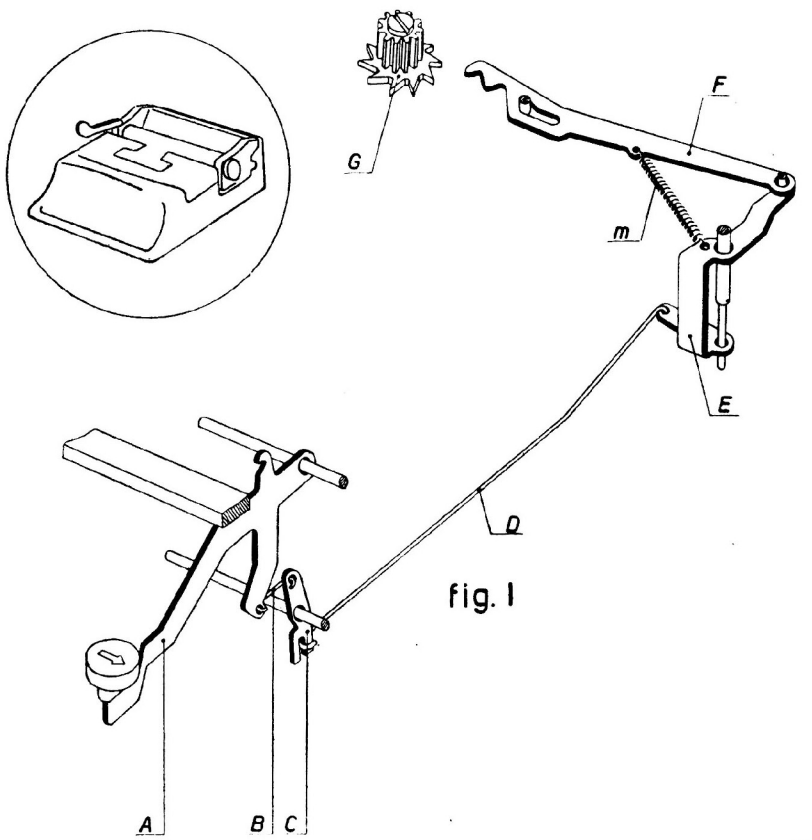
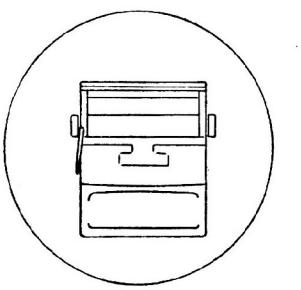


fig. I



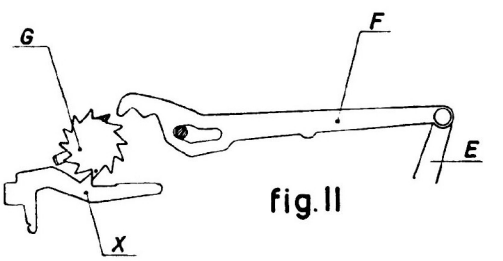


fig. II

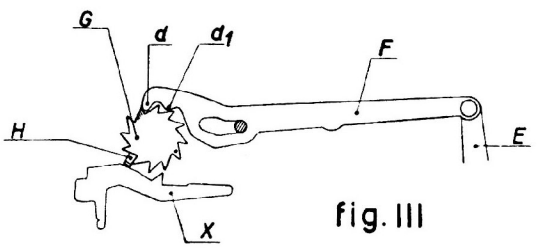


fig. III

Tabulator.

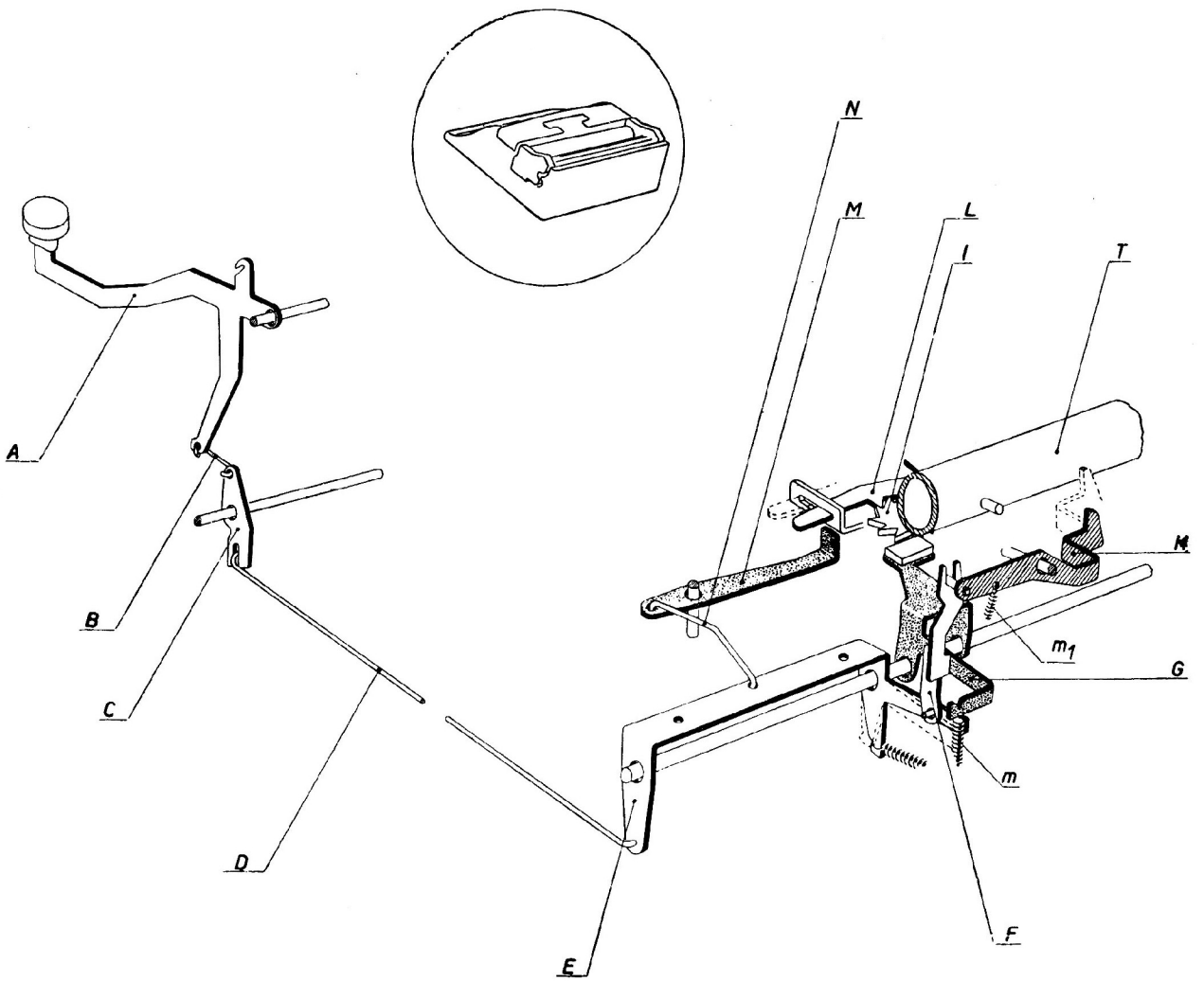
When the tabulator key is lowered, the corresponding lever **A**, through link **B**, causes lever **C** to turn. The latter, through pull rod **D** makes bridge **E** rotate.

Three different movements take place:

a) The rear arm of bridge **E** is lowered. Spring **m** draws the arm of the brake **G** downwards. The cork of brake **G** is in contact with the rail tube **T**.

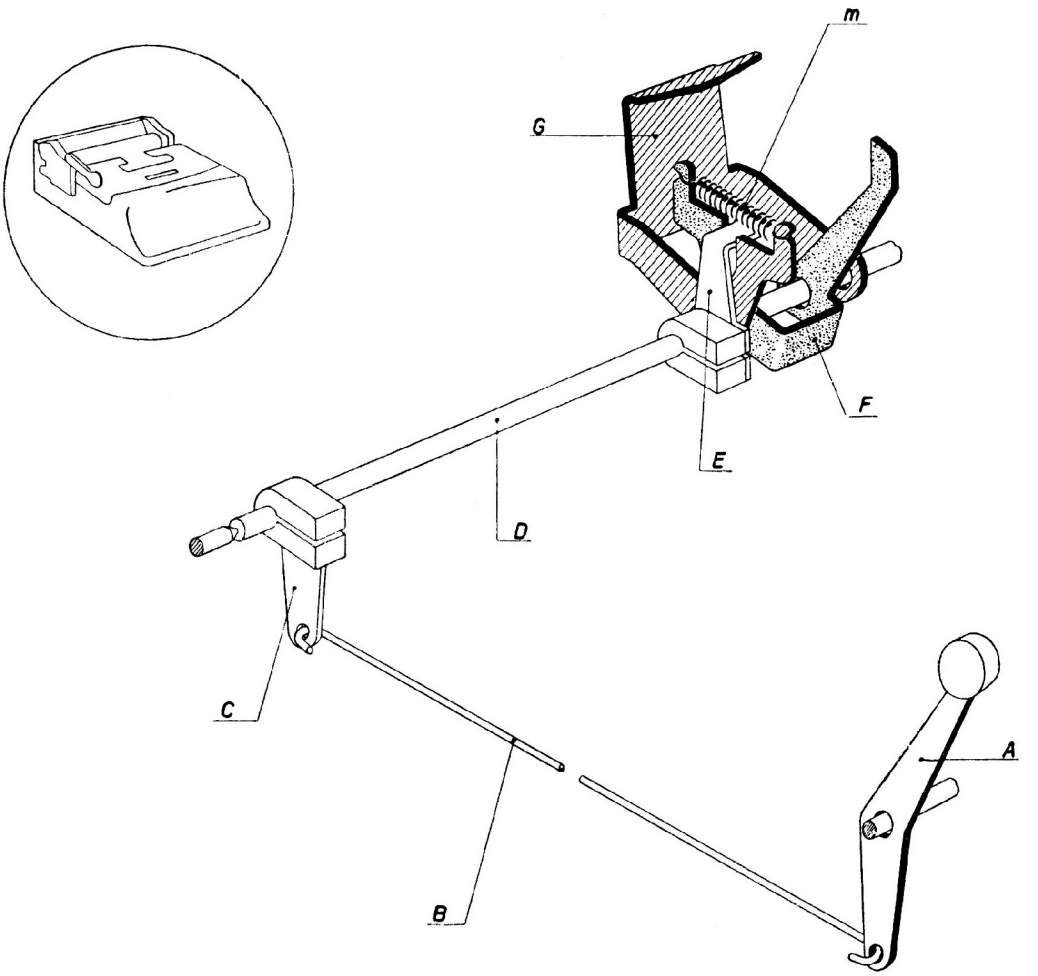
b) The same arm pulls lever **F** downwards. Spring **m1** pulls back stop **H**, the left extremity of which takes up a position to intercept the stop set.

c) At the same time, bridge **E** moves pull rod **N** which transmits the movement to lever **M**. The latter disengages the movable tooth from the escapement wheel, releasing the movable guide which can then start moving.



Setting and clearing the tabulator.

The stops of the tabulator are set and cleared by means of the small control lever **A**. This transmits the movement, through pull rod **B**, to lever **C** which, in its turn, through shaft **D**, sets crank **E** in rotation (forwards or backwards). The latter, on account of its lateral shank, makes setting lever **F** or clearing lever **G** operate.



Setting and clearing positions.

Shaft **D**, crank **E**, setting lever **F** and clearing lever **G** are shown in their positions of rest in figure 1, but not in perspective. In addition the tabulator stop carrying rod **T** and plate **H**, on which the actual setting and clearing levers rest, are also shown.

The positions taken up by different parts during the setting and clearing operation are indicated in figures II and III.

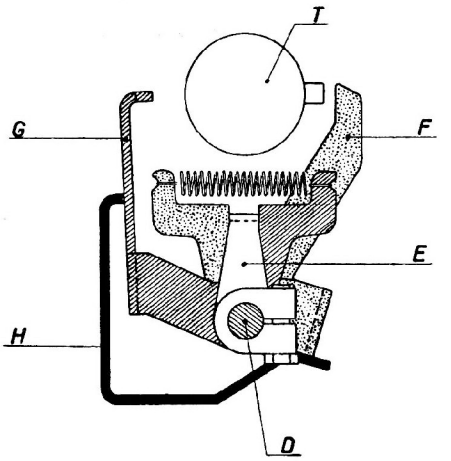
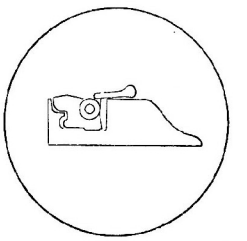


fig. I



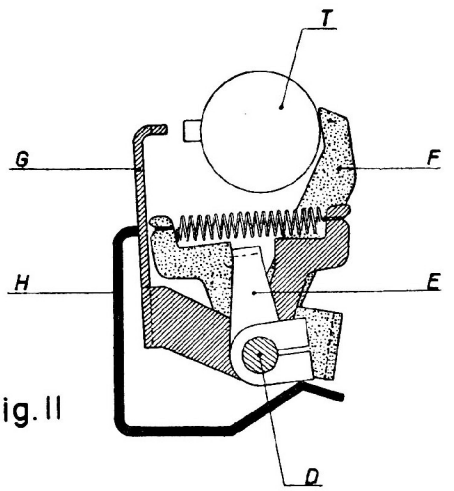


fig. II

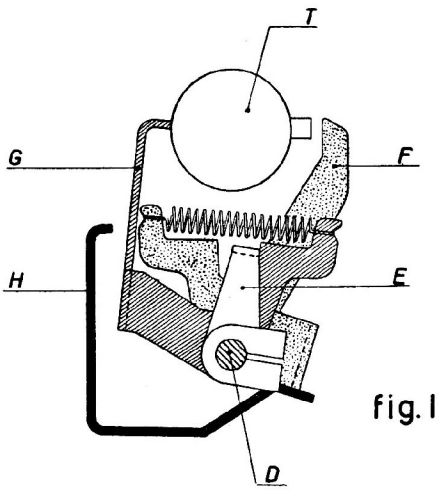
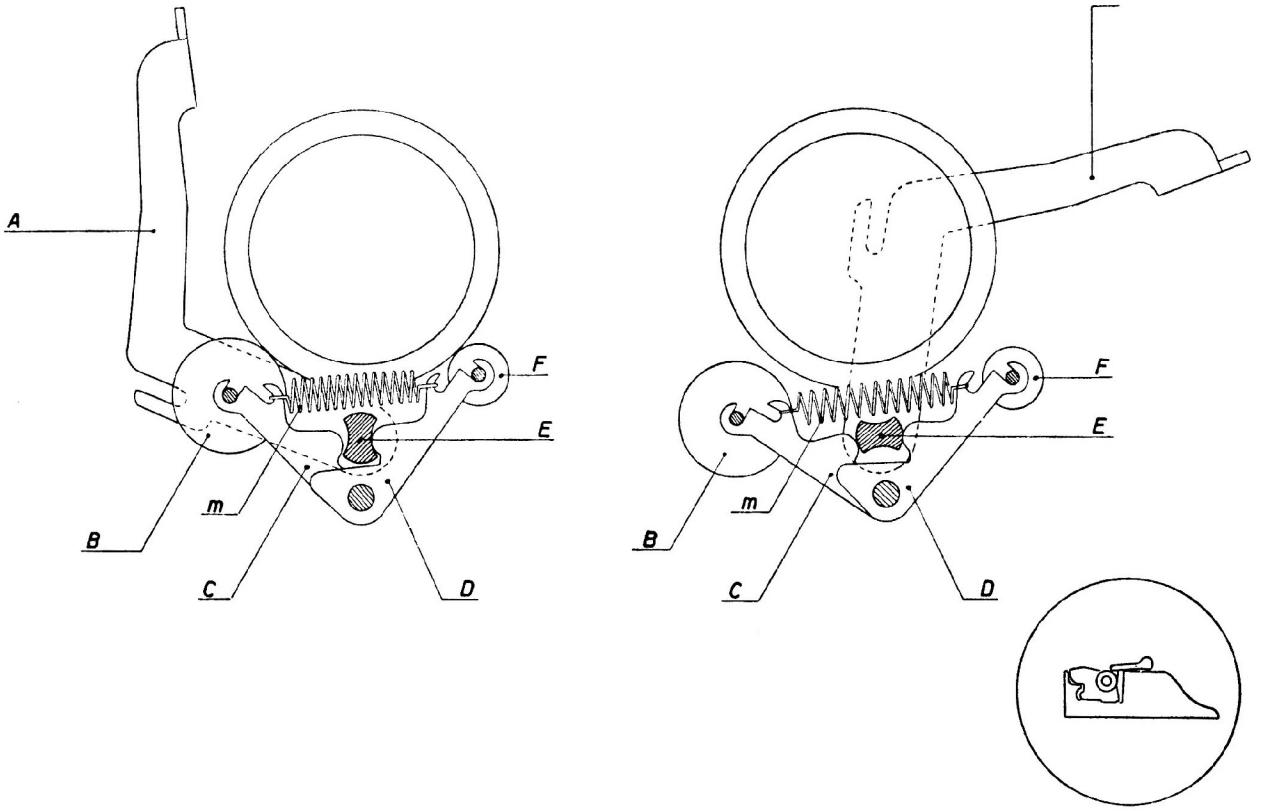


fig. III

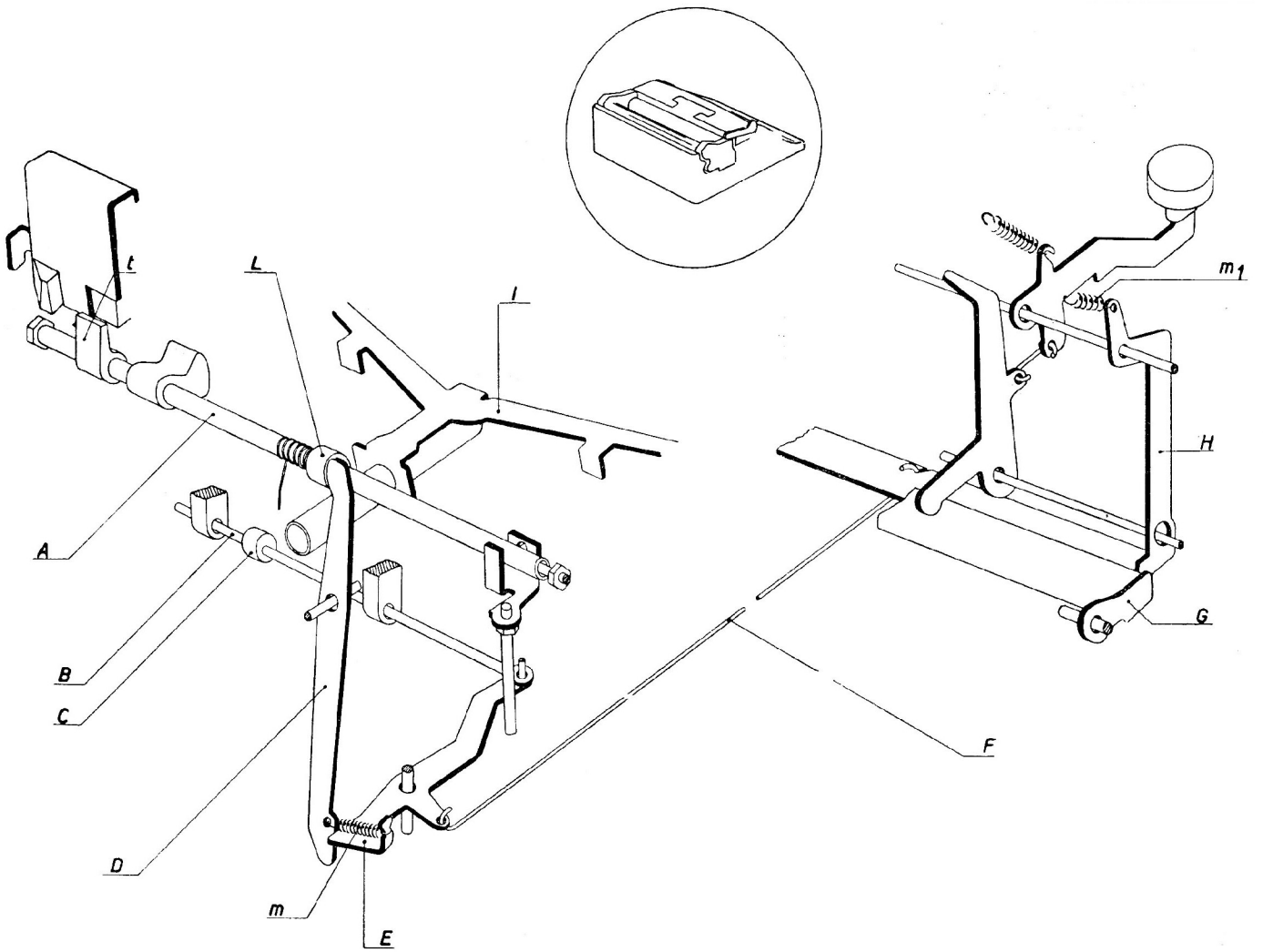
Paper release.

When the paper release lever **A** is moved forward, its shaped shaft **E** moves brackets **C** and **D**, raising the front and back paper feed rolls **B** and **F** away from the platen.



Margin setters and line locks.

In the figure the margin rod **A** is shown in its position of rest held by spring **m1** of lug **H**. The two locking systems are shown in the same figure; one on the universal frame (levers **D** and **E**, shaft **B** with its eccentric **C**) the other on the ribbon operating lug **G** (levers **D** and **E**, pull rod **F** and frame **H**). Both locking devices are in their positions of rest.



Locking movements at end of carriage run.

The right-hand margin setter (figure I) approaching tenon **t** of the margin rod **A**, operates the bell which gives audible warning that the carriage is approaching the limit of its run.

Subsequently the margin setter strikes tenon **t**, pulling along with is shaft **A** which is stopped against the support nut on the left. The carriage stops. In order to prevent typing whilst the carriage is stationary, two locking devices are brought into action. In its movement, release shaft **A**, by means of collar **L**, causes lever **D** to turn; the latter, through spring **m**, pulls lever **E**.

Shaft **B** moves and its eccentric **C** reaches a position, in relation to the universal frame **I**, such as to prevent further movement of the latter.

At the same time, lever **E** through pull rod **F** places frame **H** in position to intercept the ribbon operating lug **G** (figure II). The keyboard is thus locked.

N. B. The coupling between levers **D** and **E** is flexible (spring **m**), and the reason for this is the following: if the displacement of shaft **B** had taken place when the universal frame had not reached the rest position, it would have fouled eccentric **C**. With the device provided, this cannot take place. Actually, if universal frame **N** is not at rest, shaft **B** cannot move and lever **D** would stretch spring **m**. When the shaft is at rest, the spring is relieved, carrying the eccentric **C** to a position which intercepts the path of the frame itself.

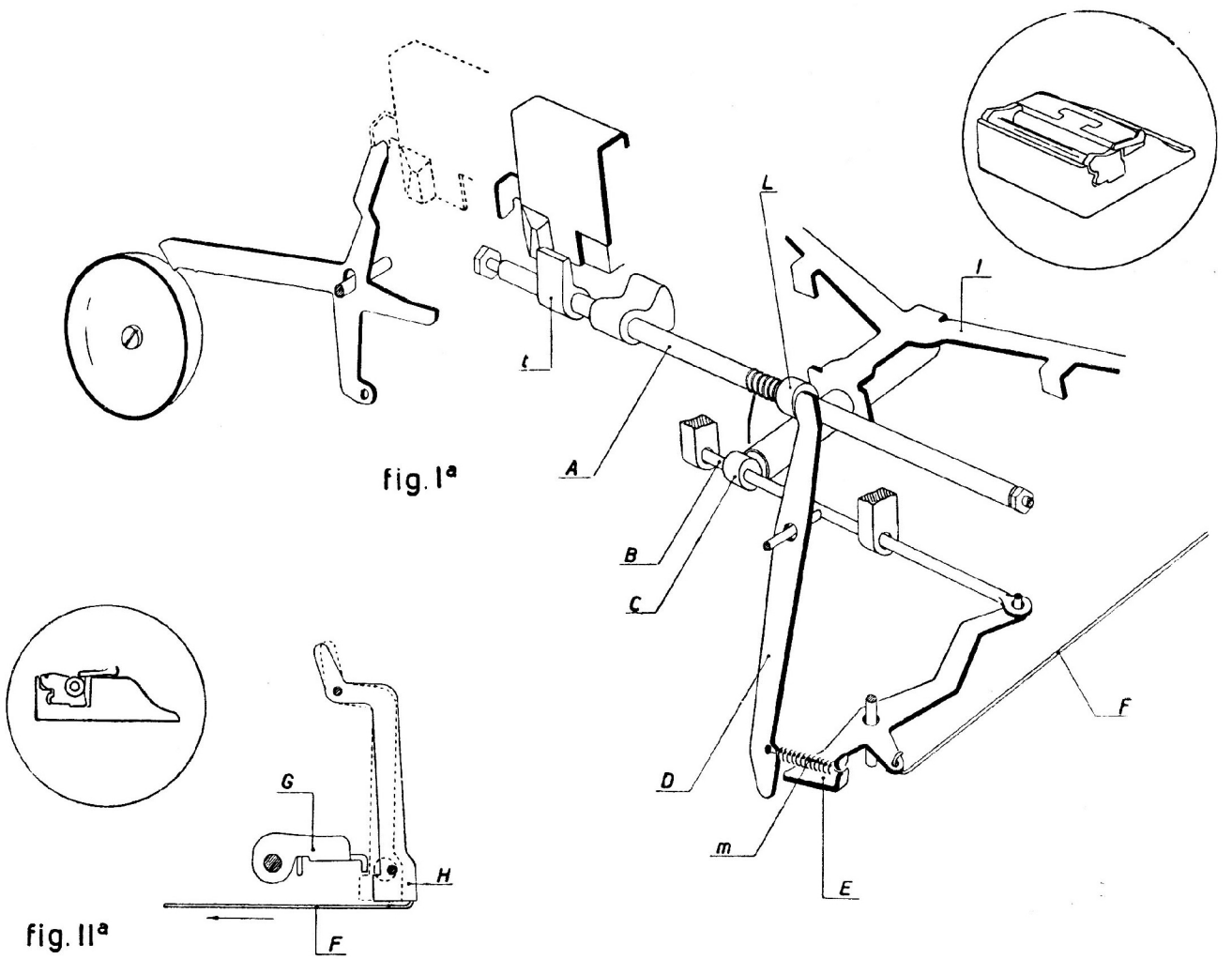


fig. I[a]

fig. II[a]

Margin release.

Whenever it is desired to continue typing beyond the point predetermined by the right hand margin setter, the margin release key **P** must be depressed (figure I). The link **O**, moved backwards, causes square **N** to turn and raise shaft **M**. The latter, through its upper fork in which is lodged a pin of the release shaft **A**, causes the shaft to rotate backwards. Thus the tenon **t** is freed from the margin setter; the locking mechanism returns to the position of rest and typing can be continued.

Naturally, carrying out the same operation, the left hand margin setter can also be passed over.

Indentation.

To indent the beginning of a line with respect to the margin set, it is only necessary to lower the margin release key before moving the carriage from left to right.

The release shaft, as already shown, rotates only slightly. Thus the left-hand margin setter is no longer stopped by the tenon **t** but by tenon **t1** which stops the carriage a given number of spaces before the margin normally set (figure II).

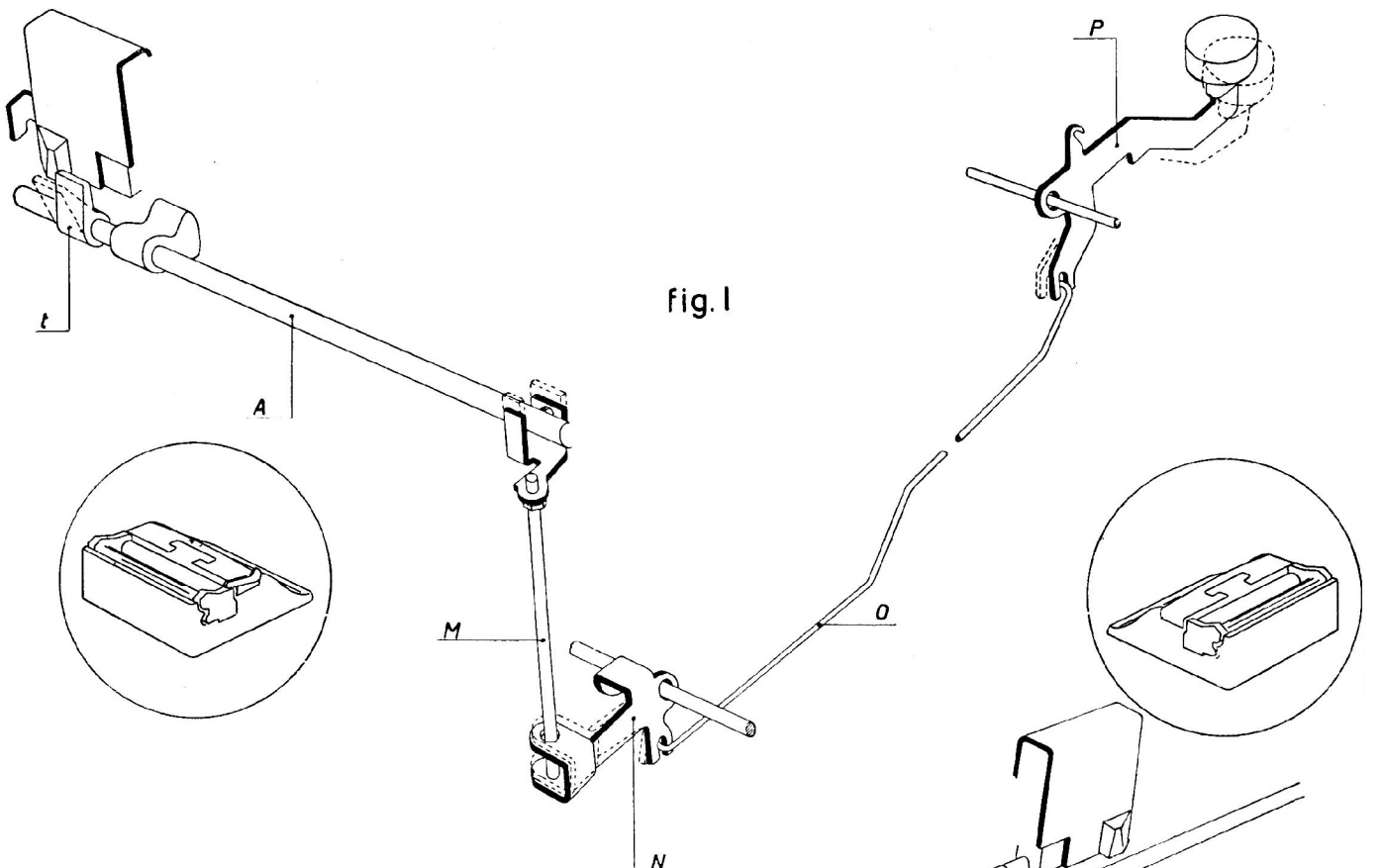


fig. I

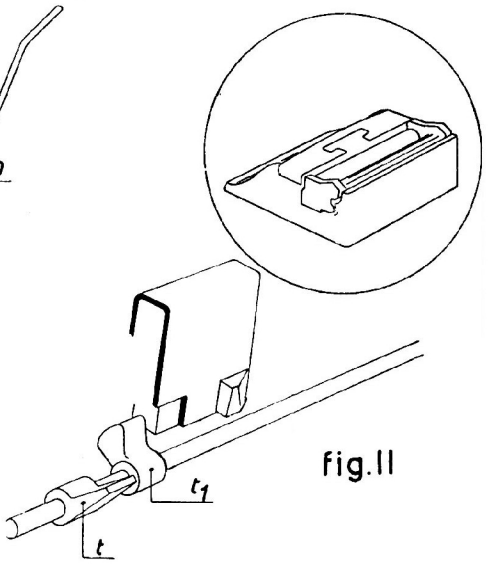


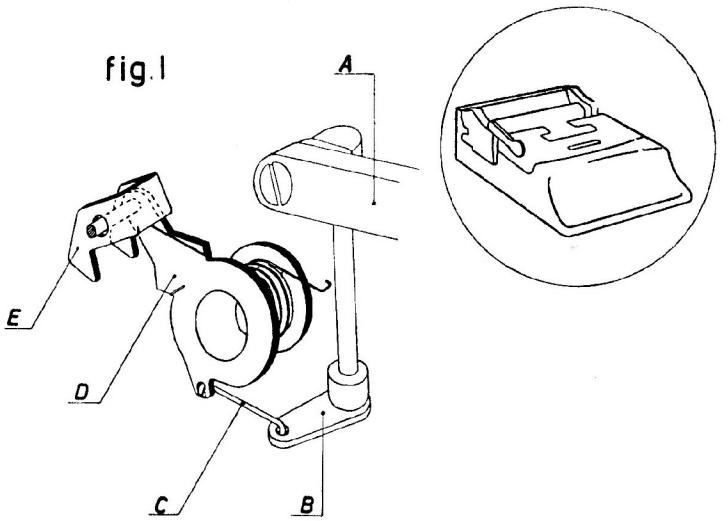
fig. II

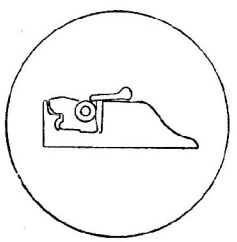
Line spacing - Position 0.

Line spacing is controlled by lever **A** (figure I) which, through crank **B**, brings pull rod **C** into action. The latter causes rotation of crank **D**. The pawl **E** of crank **D** operates directly on the line spacing wheel. The line spacing wheel **F** is held stationary, in its position of rest, by the positioner **X** (figure II). Spring **m** maintains positioner **X** pressed against wheel **F**.

When the small lever of cam **G** is placed in position **0** its shank **a** moves positioner **X** away from wheel **F** (fig. III). The platen is therefore released and can be freely rotated.

fig. I





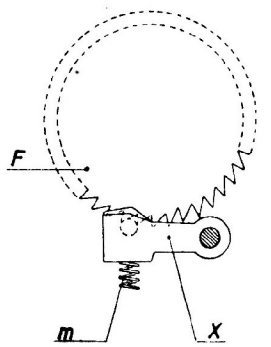


fig. II

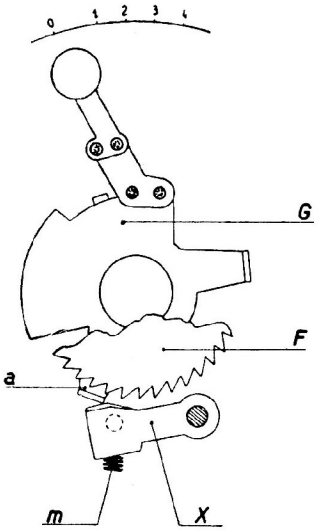


fig. III

Positions of line spacing controls.

If the line space selector is in position **1** (figure I) and the line space lever is operated, pawl **E** moves and rides on the edge of cam **G** over a certain distance. It then falls between two teeth of ratchet wheel **F** (shown shaded) and propels the latter until arrested by stop **H** (shown dotted). The line spacing wheel has moved round through two pitches.

In figure II the line space lever is in position 4. Pawl **E** is given a small idling stroke and the line spacing wheel turned through the desired five pitches.

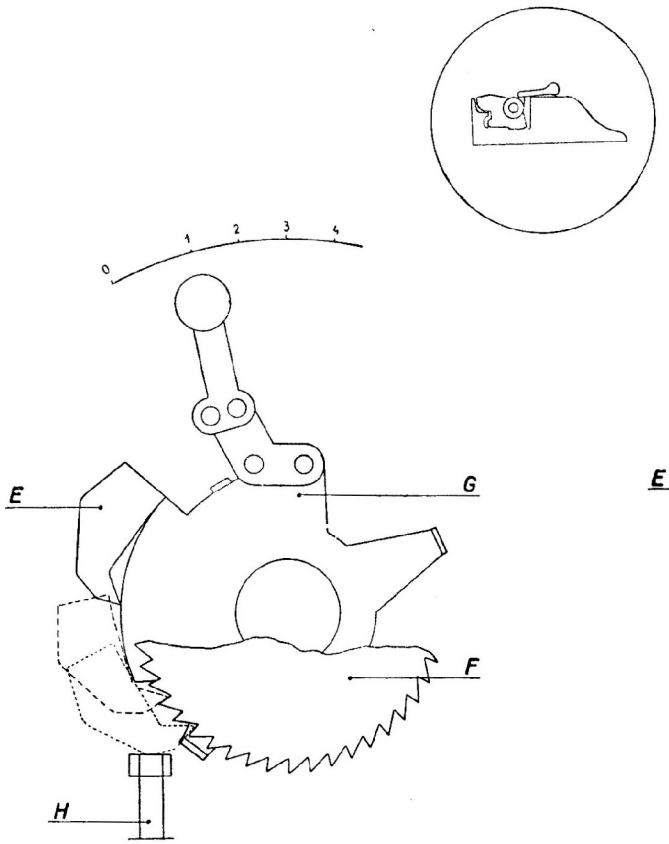


fig.I

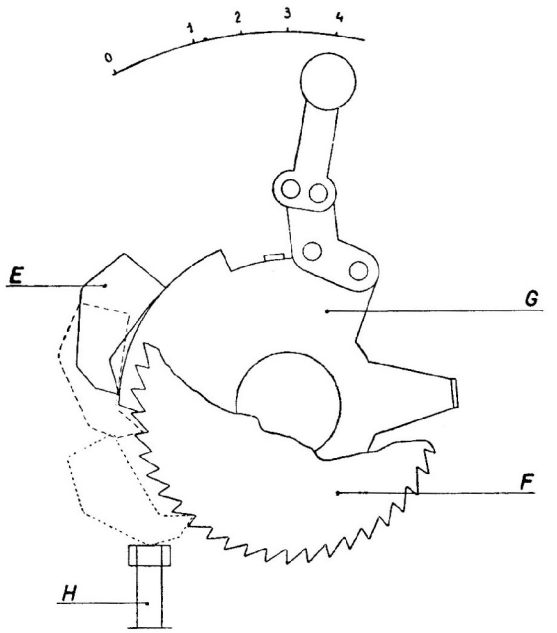
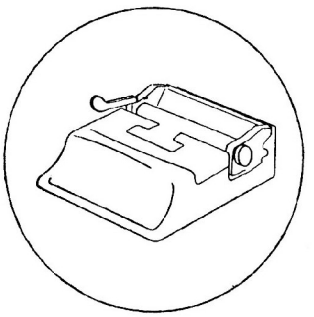


fig. II

Clutch.

When the clutch knob is pressed, the piston **A** moves from left to right. Pin **C**, which slides freely in the slot of shaft **B**, moves flange **D** (figure I) disengaging it from the line spacing ratchet wheel **F** (figure II). In this manner the platen remains independent of the line spacing ratchet wheel and can be moved freely.



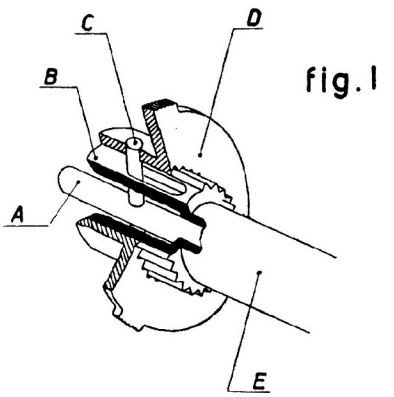


fig. I

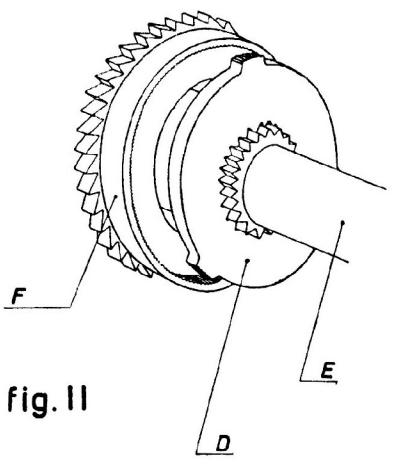


fig. II

Instructions for Assembly and Adjustment

2 - FIGURES 2 and 2 a

Insert in the slots of the guide of support P4 A 5:

— the 43 key levers;
— the margin release lever P4 Q 4;
— the back space lever P4 N 1;
— the tabulator key lever P4 V 1.

N. B. The levers of the typing keys are coded with the symbols P4 B 1/..., P4 B 2/..., P4 B 3/..., P4 B 4/... in accordance with their position on the first, second, third or fourth row of the keyboard. The first row is nearest the front of machine. The levers in the same row are not identical, but differ in the length of the arm on which the intermediate control link is hooked.

Consequently, the key levers are numbered progressively, commencing with the first key on the left. This number, which determines the position of the key lever on the keyboard, is engraved on the lever itself. There are not, however, 43 levers all differing from each other. For example, the 24th is the same as the 20th, consequently, where the 24th lever is accommodated in the slot of the comb guide P4 A 5, lever marked No. 20 is inserted.

The plate at the side which illustrates diagramatically the composition of the 43 cinematics, is a guide to the assembly of the typing key levers in the correct order.

The complete code symbol for the levers of the typing keys is as follows:

— P4 B 3/5 = third row lever - fifth position from the left;

— P4 B 1/20 = first row lever - twentieth position from the left.

P4 B 1/4	Lever for key No. 4 and No. 40
P4 B 1/8	Lever for key No. 8 and No. 36
P4 B 1/12	Lever for key No. 12 and No. 32
P4 B 1/16	Lever for key No. 16 and No. 28
P4 B 1/20	Lever for key No. 20 and No. 24
P4 B 2/2	Lever for key No. 2 and No. 42
P4 B 2/6	Lever for key No. 6 and No. 38
P4 B 2/10	Lever for key No. 10 and No. 34
P4 B 2/14	Lever for key No. 14 and No. 30
P4 B 2/18	Lever for key No. 18 and No. 26
P4 B 2/22	Lever for key No. 22
P4 B 3/1	Lever for key No. 1
P4 B 3/5	Lever for key No. 5
P4 B 3/9	Lever for key No. 9
P4 B 3/13	Lever for key No. 13
P4 B 3/17	Lever for key No. 17
P4 B 3/21	Lever for key No. 21

P4 B 3/25	Lever for key No. 25
P4 B 3/29	Lever for key No. 29
P4 B 3/33	Lever for key No. 33
P4 B 3/37	Lever for key No. 37
P4 B 3/41	Lever for key No. 41
P4 B 4/3	Lever for key No. 3
P4 B 4/7	Lever for key No. 7
P4 B 4/11	Lever for key No. 11
P4 B 4/15	Lever for key No. 15
P4 B 4/19	Lever for key No. 19
P4 B 4/23	Lever for key No. 23
P4 B 4/27	Lever for key No. 27
P4 B 4/31	Lever for key No. 31
P4 B 4/35	Lever for key No. 35
P4 B 4/39	Lever for key No. 39
P4 B 4/43	Lever for key No. 43

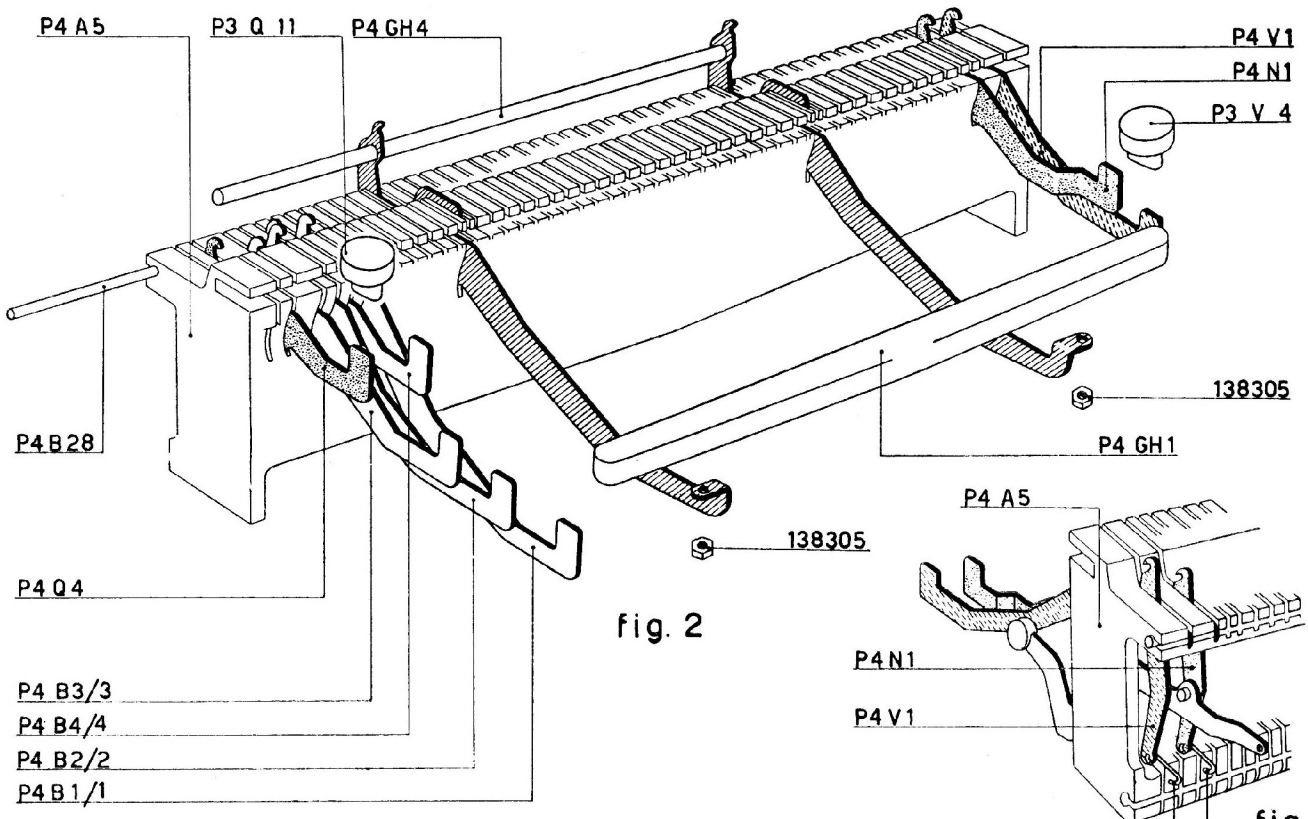


fig. 2

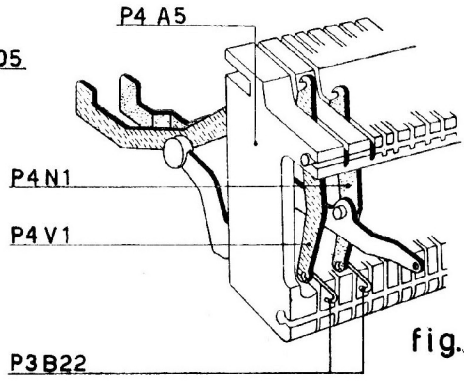


fig. 2a

In the following descriptions, **left** and **right** always mean when locking at the machine from the front, i. e. with the keyboard facing the operator. The **back** is the part where the carriage is, the **front** is where the keyboard is located.

1 - FIGURES 1 and 1 a

a) Screw a nut 138 40 5 on the two conical pivot screws 129 40 4. Place the latter on the two side of the support of the keyboard levers and first movement lever bracket P4 A 5.

b) Put the two-colour change lever P4 GL 44 on the right of the shift frame shaft P4 GG 3. The change lever should strike against the right-hand lever of the frame. ts small knob should be turned towards the front.

c) Put frame P4 GG 3 in the rear notch of bracket P4 A 5. The frame lever and that of the two-colour change lever should project through the openings for them in the front of the bracket. Secure frame P4 GG 3 with two conical pivot screws 129 40 4.

d) Adjust the position of frame P4 GG 3 axially by moving the two pivot screws 129 40 4 as required. The following two conditions should be reached.

— The left-hand lever **S** of P4 GG 3 (fig. 1a) should be a distance of 3.75 mm. (0.1476 of an inch.) from the left-hand side of the slot.

— The frame P4 GG 3 should have a minium axial play (mm. 0,03—0.0012 of an inch.) leaving it completely free to rotate.

When these two conditions are obtained, lock nuts 138 40 5 on the two conical pivot screws 129 40 4.

e) Fix the lever of the shift lock P4 G 16 on the left-hand shift frame lever P4 GG 3 with stud P4 G 17 and nut 138 30 5. Check that it rotates with perfect freedom.

Hook spring 62 30 11 between P4 G 16 and the corresponding lever of P4 GG 3.

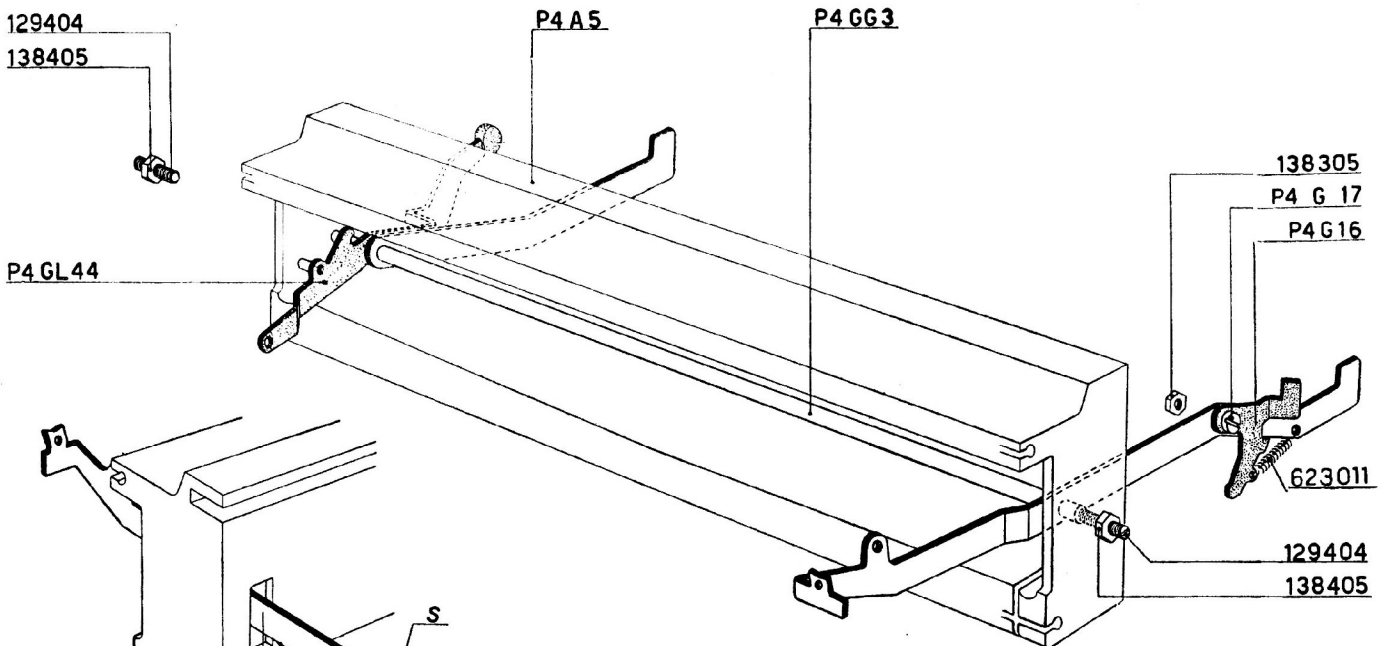


fig. 1

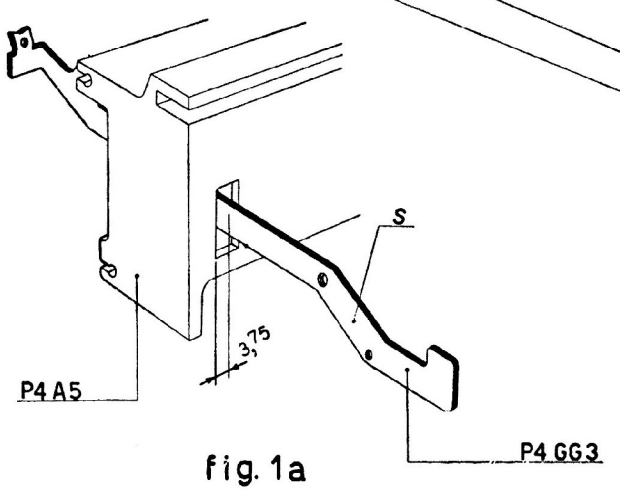
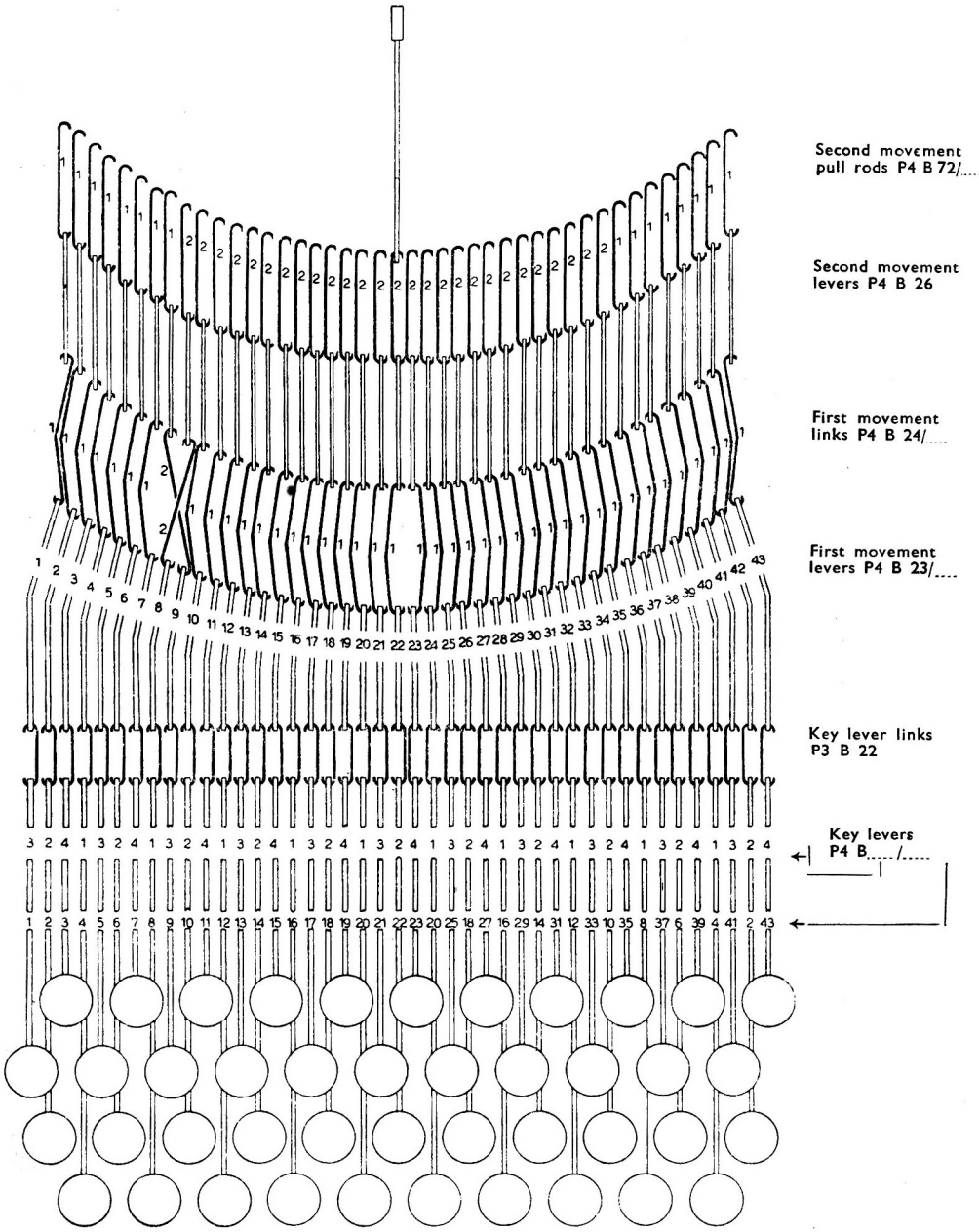


fig. 1a

P4 A 5	Key and first movement lever support	P4 GL 44	Two-colour shange lever
P4 G 16	Shift lock lever	129 40 4	Conical pivot screw for P4 GG 3
P4 G 17	Cheese head pivot stud screw for P4 G 16	138 30 5	Hexagonal nut for P4 G 17
		138 40 5	Hexagonal nut for 129 40 4
P4 GG 3	Shift frame shaft	62 30 11	Spring for P4 G 16


Second movement pull rods P4 B 72/.....
Second movement levers P4 B 26
First movement links P4 B 24/....
First movement levers P4 B 23/....
Key lever links P3 B 22
Key levers P4 B...../.....

a) Place support P4 A 5 in the position shown in figure 2. Introduce on the left hand side the undersized wire pin (2,6 UA 8058/1) and advance it little by little as one by one the levers making up the keyboard are placed in their respective guide slots.

b) Assemble the levers on comb P4 A 5 in the following order:

1st slot	left free
2nd slot	margin release lever P4 Q 4
3rd-12th slot	typing key levers in the order indicated in the diagram
13th slot	left arm of the space bar frame P4 GH 4
14th-36th slot	typing key levers in the order indicated in the diagram
37th slot	right arm of the space bar frame P4 GH 4
38th-47th slot	typing key levers in the order indicated in the diagram
48th slot	left free
49th slot	back space key lever P4 N 1
50th slot	tabulator key lever P4 V 1.

N. B. Before placing levers P4 N 1 and P4 V 1 on the wire pin, hook on to it link P3 B 22 in the direction shown in figure 2 a.

c) Insert wire pin P4 B 28 at the same time removing the one with the undersize diameter.

d) Check the complete freedom of movement of each individual lever in its corresponding guide slot.

e) On the front of the arms of the space bar frame P4 GH 4, assemble the bar P4 GH 1. Secure it with two nuts 138 30 5. Check that bar P4 GH 1 is level.

P4 A 5	Key levers and first movement support
P4 B 1/...	First row key levers
P4 B 2/...	Second row key levers
P4 B 3/...	Third row key levers
P4 B 4/...	Fourth row key levers
P4 B 28	Wire pin for keys and first movement levers
P4 GH 1	Space bar
P4 GH 4	Space bar frame
P4 N 1	Back space key lever
P4 Q 4	Margin release key lever
P4 V 1	Tabulator lever
P3 B 22	Key lever links
P3 Q 11	Margin release key
P3 V 4	Column selector key
138 30 5	Nut for P4 GH 1

3 - FIGURE 3

Mount the sector P4 GL 59 on the front part of support P4 A 5. The slot of its rear shank is placed on the shaft of the shift frame P4 GG 3 to the right of the two-colour change lever P4 GL 44. Secure the sector to the support with two screws 120 30 3 which should be partially screwed in and not locked.

Move sector P4 GL 59 in the direction of its slot so as to reduce the axial play of lever P4 GL 44 to the minimum compatible with complete freedom in rotation.

In addition, check that the sector P4 GL 59 is absolutely vertical and that the shift frame still rotates freely.

The rear shank of P4 GL 59 may, in fact, interfere with its free movement.

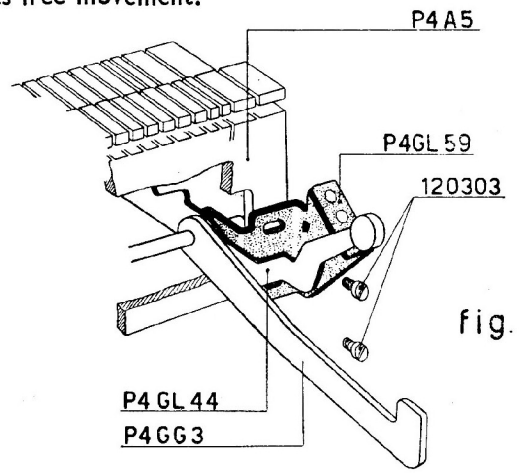


fig. 3

Having obtained the above conditions, screw in the two screws 120 30 3.

4 - FIGURE 4

Hook links P3 B 22 to the key levers. Place support P4 A 5 as shown in the figure and proceed as follows:

a) From the first lever on the left to the twenty-second (corresponding on the standard keyboard to the letter H) hook as many links P3 B 22, in the direction shown in figure 4.

b) From the twenty-third to the forty-third lever, hook on twenty-one links in the opposite direction.

P4 A 5	Key lever and first movement support
P4 GG 3	Shift frame
P4 GL 44	Two-colour change lever
P4 GL 59	Sector for two-colour change lever
P3 B 22	Key lever links
120 30 3	Cheese head screws for P4 GL 59

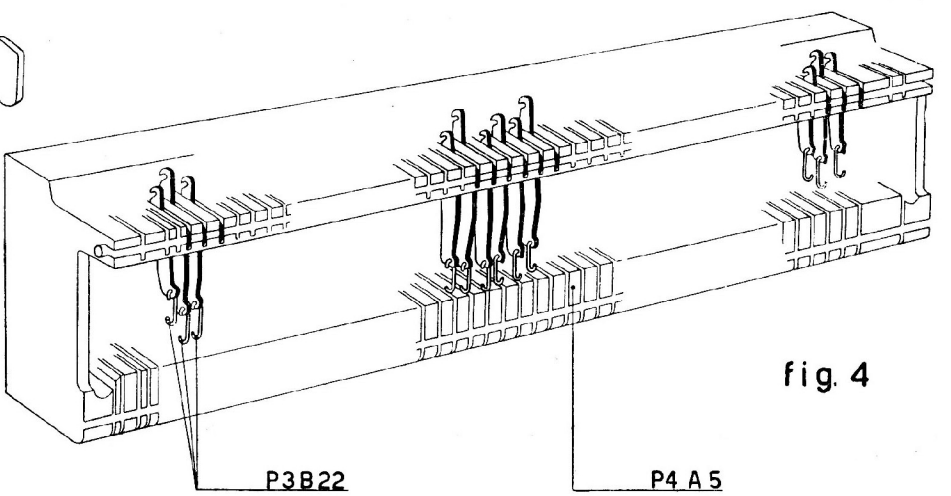


fig. 4

5 - FIGURE 5

The first movement levers P4 B 23/1 ÷ 43 are all different from each other. Some of them have the same profile, but the upper bend is set in the opposite direction.

They are numbered progressively from 1 to 43. Note that only on the central lever has the engraving of its number (22) been omitted. The numeration of key levers is always understood as being from left to right.

The code symbol of the first movement levers is indicative of the exact position which each lever must take. For example:

— the P4 B 23/1 is the first lever on the left;

— the P4 B 23/22 is the centre lever;

— the P4 B 23/43 is the lever placed at the extreme right.

In whatever case, it is very simple to recognize the position which an individual lever should take. Starting from the centre and working towards the two sides, their vertical stems become longer and the bends sharper.

a) Place the support P4 A 5 as shown in the figure 5.

b) Hook the links of the corresponding key levers to the first movement levers P4 B 23/23. This job should be carried our with the help of a spring anchoring tool. Place P4 B 23/23 in the corresponding guide slot of the support. Insert on the left of the latter, wire pin P4 B 28 which is advanced until the first movement lever, already in position, is hinged on it.

c) Continue with the assembly of the first movement levers until P4 B 23/43 is reached.

d) Slide the wire pin P4 B 28 to the right so as to free the slot where the first movement lever P4 B 23/22 must be placed.

e) Mount the first movement lever P4 B 23/22, following the instructions already given, and continue in order until P4 B 23/1 is in position.

N. B. If the assembling has been correctly done, i. e. by placing the first movement levers in their exact positions, it should be found that:

— the horizontal shanks form the arc of a circle;

— the links P3 B 22 are almost all horizontal except two which are somewhat sloped. These correspond to levers P4 B 23/11 and P4 B 23/32.

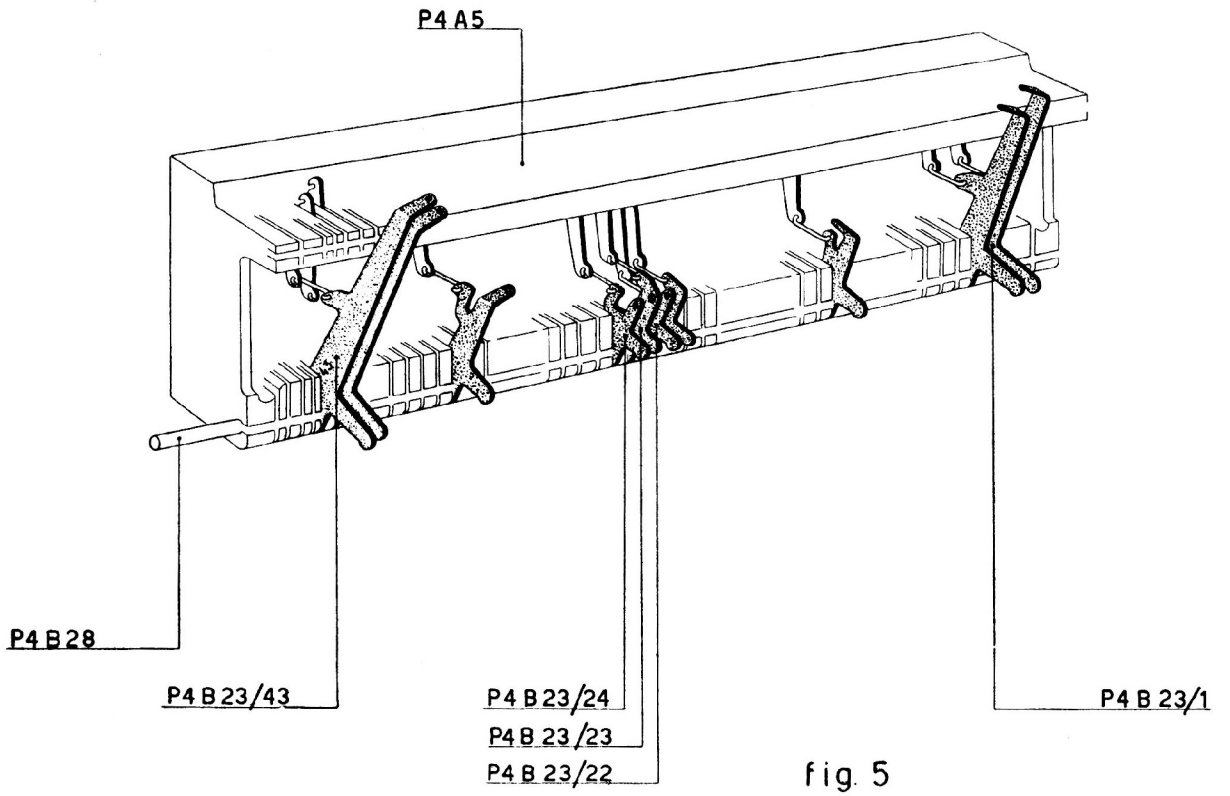


fig. 5

P4 A 5	Key lever and first movement support	P4 B 28	Wire pin for key and first movement levers
P4 B 23/1 ÷ 43	First movement levers		

6 - FIGURES 6 and 7

a) Place the support P4 A 5 in the position indicated in the figure.

b) Pull the wire pin P4 B 28 towards the left so as to free the first three slots on the right of the support.

c) The first movement lever of the back spacer P4 N 7, after link P3 B 22 of lever P4 N 1 has been hooked on to it, is then placed in the third slot (figure 6).

Advance the wire pin P4 B 28 until lever P4 N 7 mentioned above is stopped.

d) The two-colour trip crank P4 L 45 is placed in the second slot. Push the wire pin until the former is hinged on it.

Between P4 L 45 and the two-colour change lever P4 GL 44, hook spring 61 40 1/P (figure 7).

e) In the last slot, place the second lever P4 N 7 after having hooked on to it link P3 B 22 of lever P4 V 1.

Advance the wire pin P4 B 28 until P4 N 7 is hinged on it.

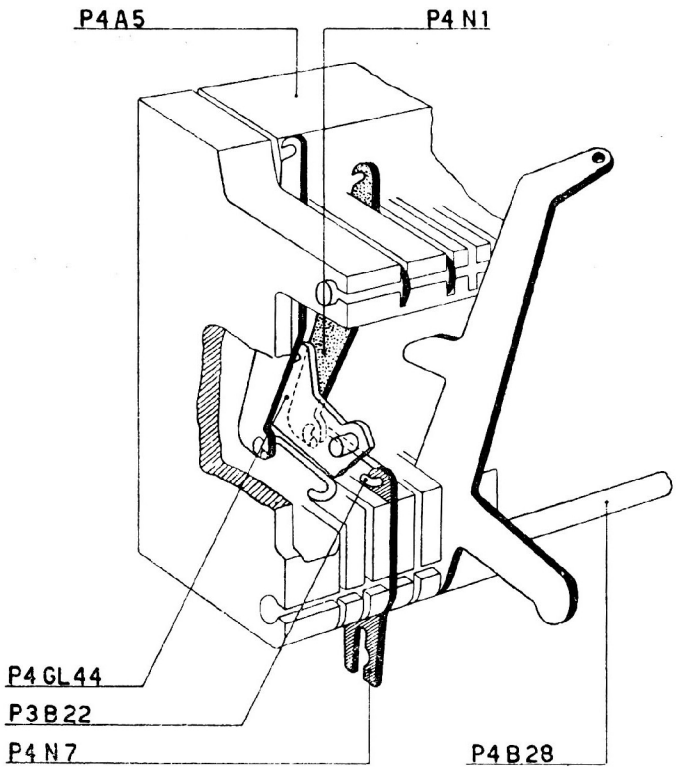
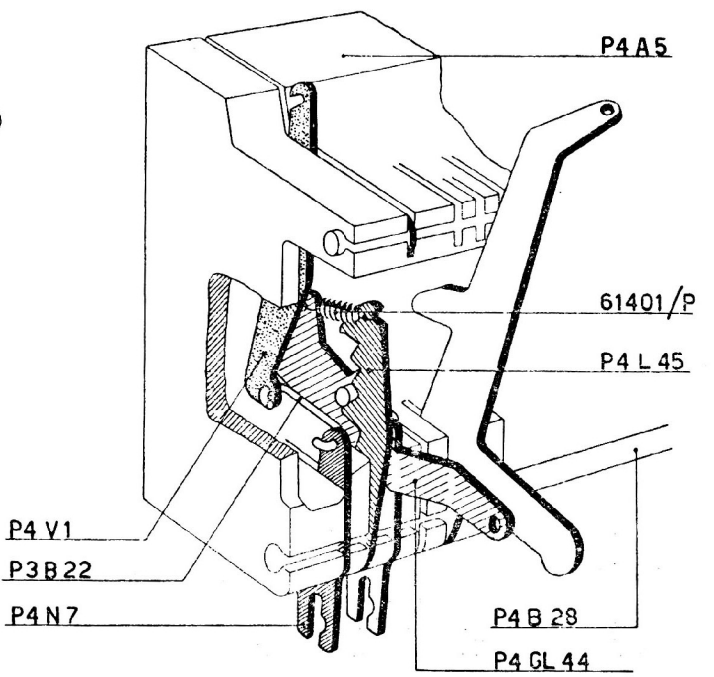


fig. 6

fig. 7



P4 A 5	Key lever and first movement support	P4 N 7	First movement back space and tabulator lever
P4 B 28	Wire pin for key levers and first movement	P4 V 1	Tabulator key
P4 L 45	Two-colour trip crank	P3 B 22	Key lever links
P4 GL 44	Two-colour change lever	61 40 1/P	Spring for P4 L 45
P4 N 1	Back space key lever		

7 - FIGURE 8

The two-colour change lever P4 GL 44 should be in contact whith its sector P4 GL 59. If necessary, adjust the lower bend of P4 GL 44 with a setting tool **G**.

Check again that the shift frame rotates freely.

8 - FIGURE 9

Mount the shift pull rod P4 G 4 on the left lever of the shift frame P4 GG 3 using a spring holding stud P4 G 10.

Hook spring M2 H 14 between the bend of the former and stud P4 G 10.

9 - FIGURE 9

Secure the control lever P4 GH 7 at the left end of the space bar frame shaft with its screw 125 30 26.

Temporarily set the lever so that it does not interfere with other pieces. Do not tighten screws right home.

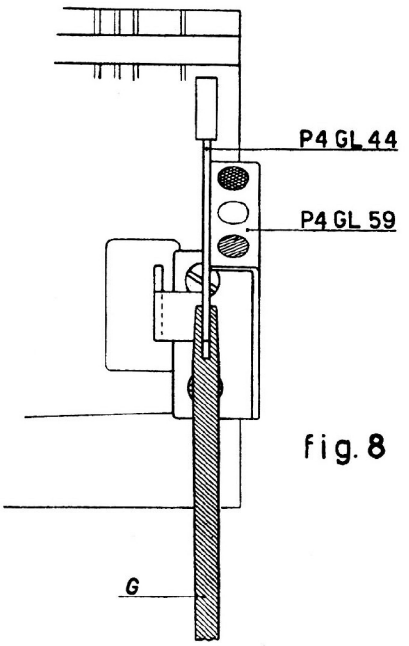


fig. 8

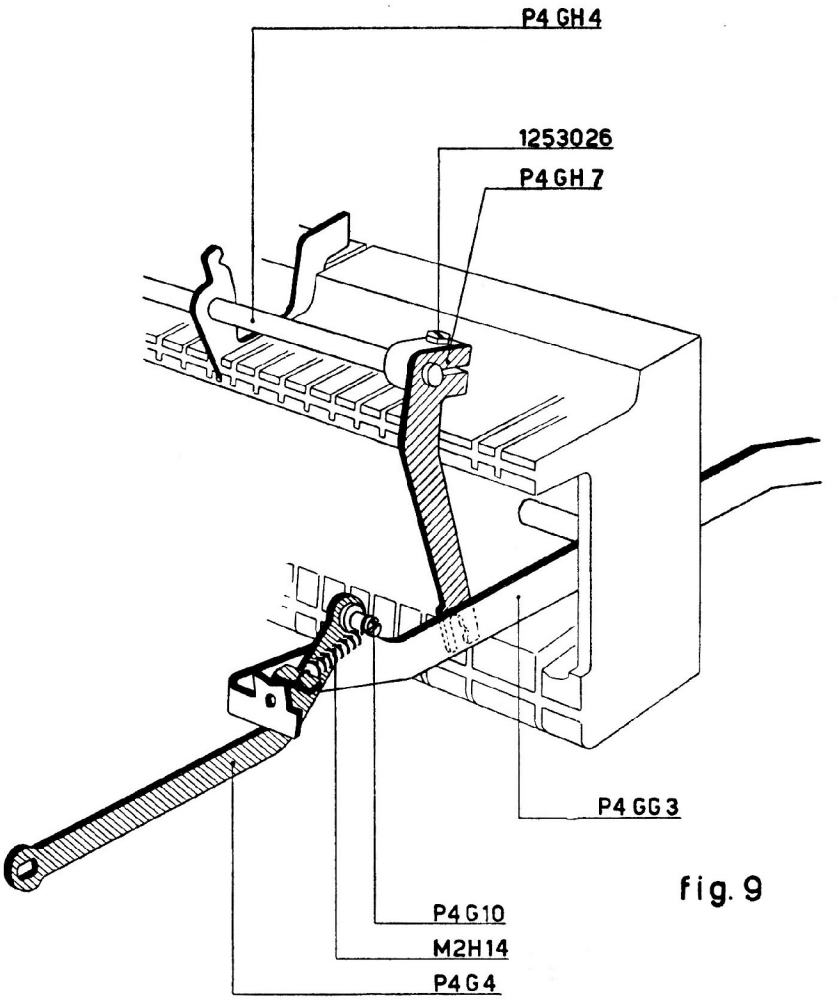


fig. 9

P4 G 4	Shift pull rod	P4 GL 44	Two-colour change lever
P4 G 10	Special stud for shift pull rod	P4 GL 59	Sector for two-colour change lever
P4 GG 3	Shift frame	M2 H 14	Spring for shift flexible joint
P4 GH 4	Space bar frame	125 30 26	Special clamp screw for P4 GH 7
P4 GH 7	Spacer control lever		

10 - FIGURE 10

a) Place the support P4 A 5 as shown in the figure.

b) Insert two short wire pins from the right of the support, so as to partially expel the proper wire pins **A** and. **B**. The third slot, upper right, and the fourth slot, lower right, must be cleared. In them is placed arm **D** of key locking frame P4 Q 10.

Advance wire pins **A** and **B** so that the frame arm is hinged on them and at the same time push out the short pins.

c) Move wire pins **A** and **B** to the right so as to free the first slots on the left (lower and upper) of the support P4 A 5. In them place left arm **S** of frame P4 Q 10.

d) Replace the wire pins in their normal position.

N. B. The wire pin **A** is the fulcrum of frame P4 Q 10. Wire pin **B** determines the limit of its travel.

e) Check the complete freedom of rotation of frame P4 Q 10. Make sure that its arms **S** and **D** are level.

11 - FIGURE 10

Arrange the stop lever leather strip in its seat on the front of bracket P4 A 5. The rough surface should be face up and a thin layer of adhesive should be placed on it.

The leather strip should be centred in respect of support P4 A 5 and pressed down to the bottom of its seat.

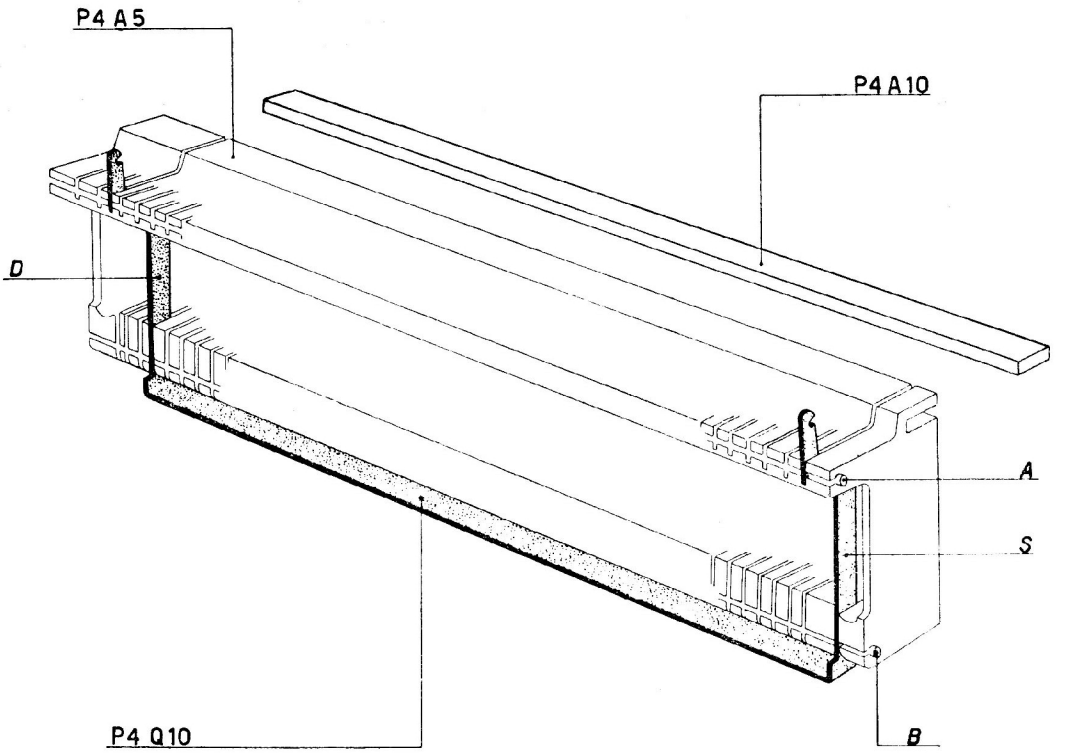


fig. 10

P4 A 5	Key lever and firt movement support	P4 Q 10	Key lever locking frame
P4 A 10	Leather strip for stop lever		

12 - FIGURES 11 - 12

a) Fix the rubber caps P4 G 12 on the four regulators of shift P4 G 11 (figure 11). The head of the regulator should be inserted into the special cavity made in the cap itself.

b) On left hand side member P4 A 1, mount:

— on nipples **A** and **B**, two of the four regulators now prepared, securing them with nuts 138 40 5;

— on nipples **C** and **D**, the regulators P3 I 12 with corresponding nuts 138 40 5. As a preliminary adjustment, see that only a single thread of the regulator P3 I 12 projects from the upper surface of the nipples.

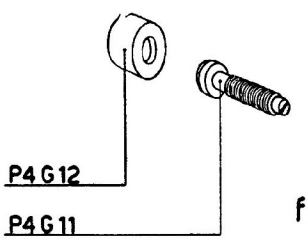


fig. 11

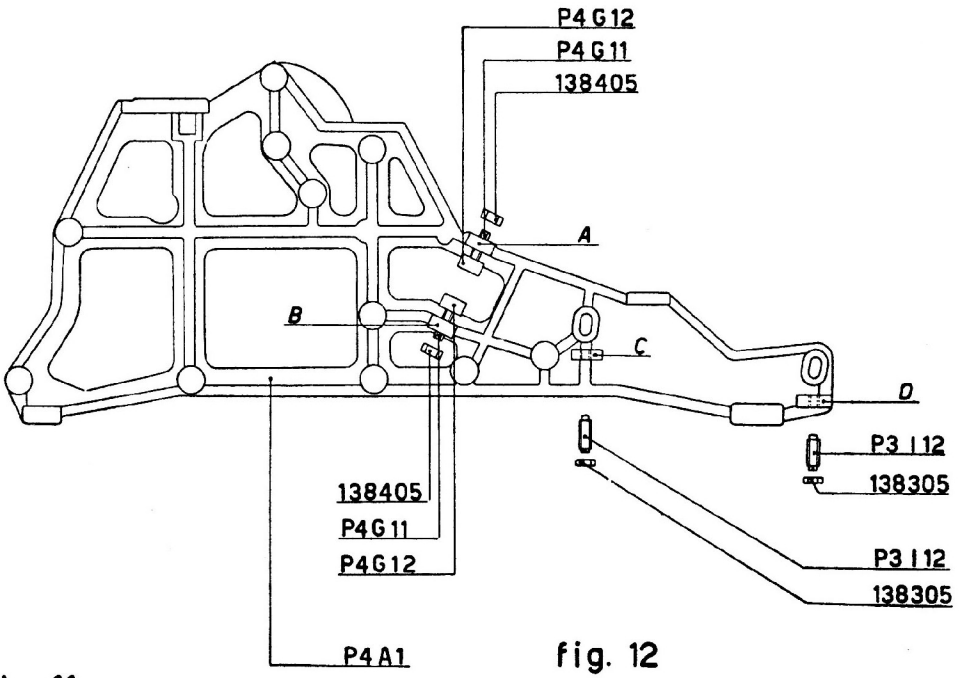


fig. 12

P4 A 1	Side member - left hand	P3 I 12	Trip regulator V. T.
P4 G 11	Shift regulator	138 30 5	Hexagonal nut for P3 I 12
P4 G 12	Rubber cap for shift regulator	138 40 5	Hexagonal nut for P4 G 11

12 - FIGURES 13 and 13a

On the right hand side member P4 A 2 assemble:

— on nipples **A** and **B** the two regulators previously prepared, securing them with nuts 138 40 5;

— on nipples **C** and **D**, the regulators P3 I 12 with 138 30 5. As a preliminary adjustment, see that only a single thread of the regulator P3 I 12 projects from the upper surface of the nipple.

The ribbon carrier stop eccentrics P4 L 43 in holes **E** and **F**, securing them with nuts 138 35 1.

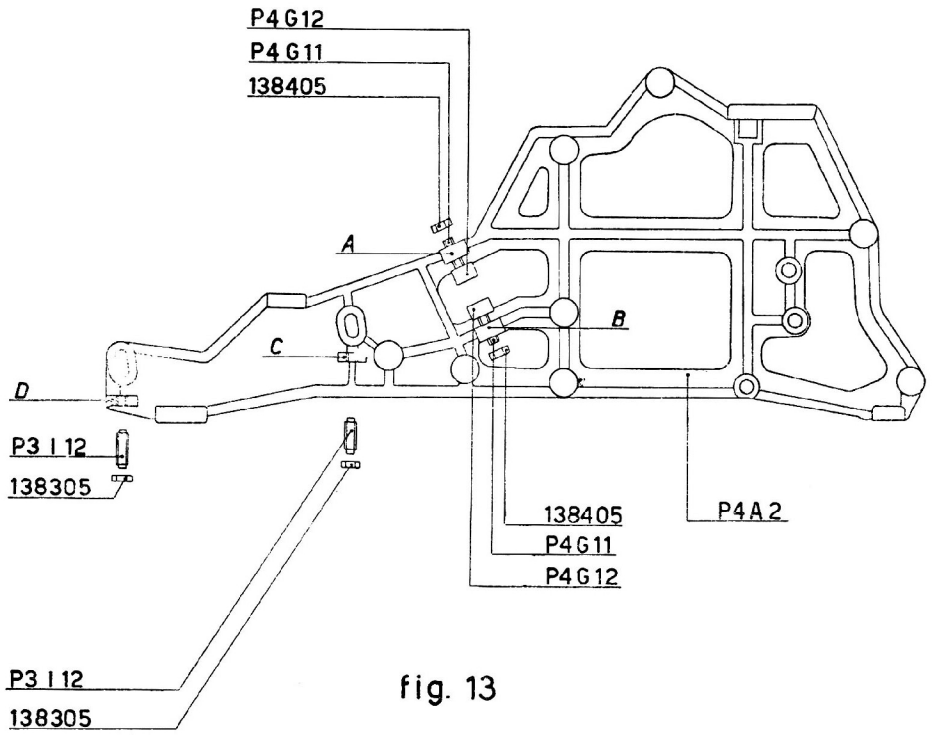


fig. 13

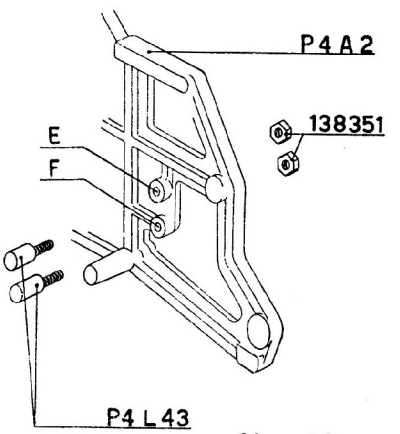


fig. 13a

P4 A 2	Side member - right hand	P3 I 12	Trip regulator N. T.
P4 G 11	Shift regulator	138 30 5	Hexagonal nut for P3 I 12
P4 G 12	Rubber cap for shift regulator	138 35 1	Hexagonal nut for P4 L 43
P4 L 43	Eccentric for ribbon carrier stop	138 40 5	Hexagonal nut for P4 G 11

13 - FIGURE 14

a) Assemble the two side members of the machine P4 A 1 and P4 A 2 on the key lever and first movement support P4 A 5, positioning them as high as possible in relation to it. Secure them with four screws 120 35 5.

b) Connect the rear part of the two side members P4 A 1 and P4 A 2 by means of the small bar UA 8178/1. Secure the latter with two screws 120 35 5.

c) Place under the side members of the machine:

— iron feet UA 8172/1 at the front;

— the temporary brackets UA 8173/5 and UA 8173/6 with the iron feet UA 8172/2 at the back.

d) Place the outer frame of the machine level on an iron plate. Screw in tightly the side member and small rear bar screws.

14 - FIGURE 14

Assemble the touch control trigger P4 B 30 and the crank for touch control spring P4 GB 31 on the left hand side member P4 A 1 with two studs 126 30 33.

15 - FIGURE 14

a) Hook four springs 61 40 1/P in the rear openings on the spring carrying cross piece P4 B 21.

b) Place the spring carrying cross piece P4 B 21 on the two side members and secure it with two screws 120 30 3 (in holes **A** and **B**).

c) Hook spring 61 40 1/P to the upper hooks of the key lever locking frame P4 Q 10 and the space bar frame P4 GH 4.

d) Hook spring No. M2 B 25 between the 46 bent extensions of the spring carrying cross piece P4 B 21 and the hooks of the:

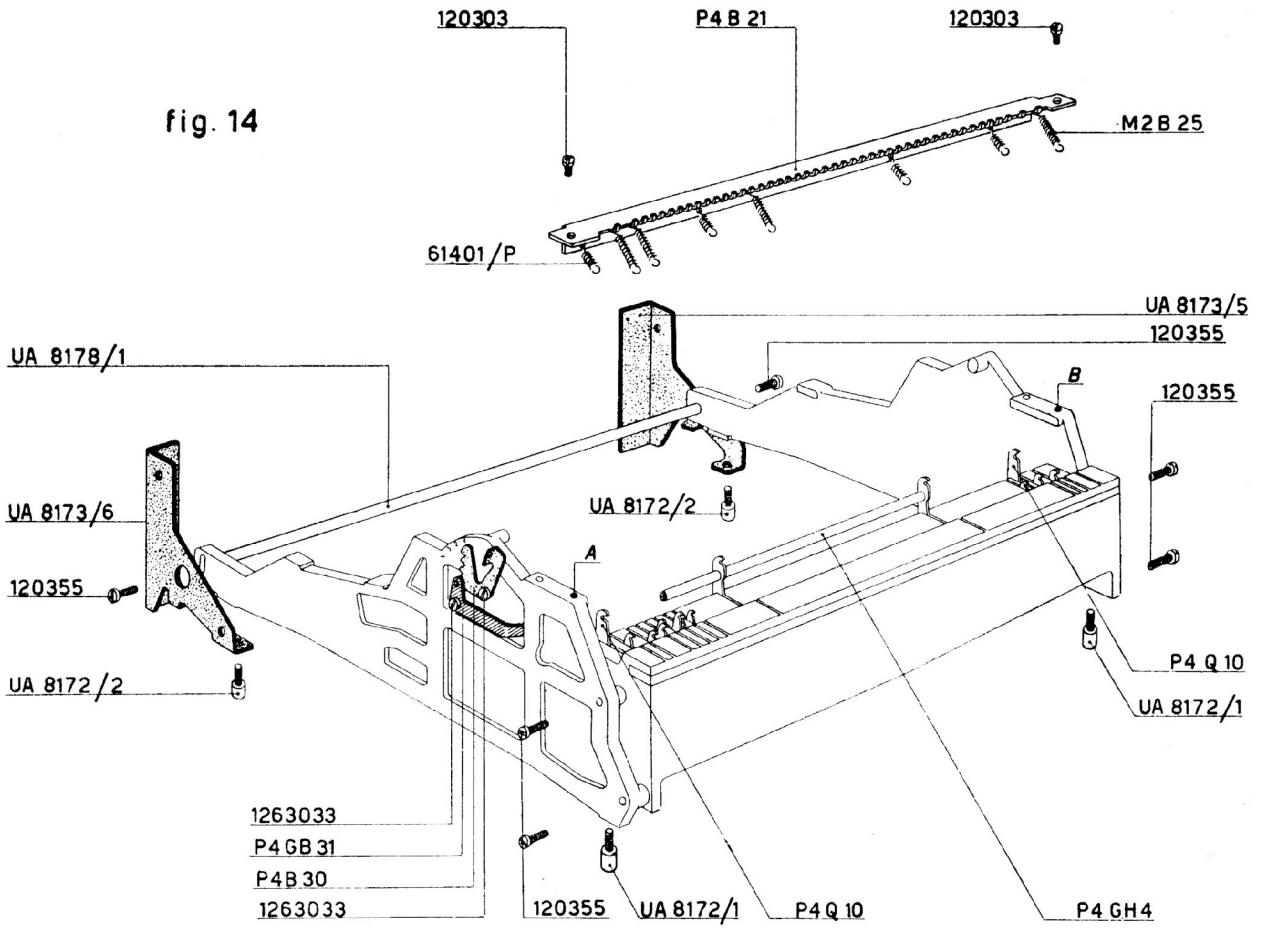
— margin release lever;

— 43 printing key levers;

— back space control lever;

— tabulator control lever.

fig. 14



P4 B 21	Spring carrying cross piece	UA 8173/6	Left hand machine support bracket
P4 B 30	Touch control trigger	UA 8178/1	Re-inforcement bar for side members
P4 GB 31	Crank for touch control spring	120 30 3	Cheese head screw for P4 B 21
P4 GH 4	Space bar frame	120 35 5	Cheese head screw for P4 A 5 - UA 8178/1
P4 Q 10	Key lever locking frame		
M2 B 25	Key lever return spring	126 30 33	Cheese head pivot stud screw for P4 B 30 - P4 GB 31
UA 8172/1	Front foot		
UA 8172/2	Back foot	61 40 1/P	Spring for P4 Q 10 - P4 GH 4
UA 8173/5	Right hand machine support bracket		

16 - FIGURE 15

Preparation of the left hand ribbon holder unit P4 BL 15.

a) Place washer 40 42 1 on the spool shaft P4 EL 12. Insert the shaft in the upper opening of the left hand bracket P4 EL 15. The washer seats on the bracket itself.

On the shaft P4 EL 12, assemble in succession:

— the hole of the upper bend of the left hand lug P4 L 25;

— washer 40 31 2;

— the small spring for braking the spool P3 L 63.

Place the shaft in position in the lower opening of bracket P4 EL 15. Fix the ribbon feed crown wheel P3 GL 11 with its screw 124 30 7.

b) The shank **A** of lug P4 L 25 should lodge in the special guide slot made in the upper surface of the bracket P4 EL 15. Bending lug P4 L 25 gently, lodge the hole of its lower bend on the extremity of shaft P4 EL 12.

c) Move the crown wheel P3 GL 11 axially so as to give shaft P4 EL 12 an anxial play of 0,6 mm. (0.023 of an inch.). Check that the shaft itself rotates with perfect freedom; remember that its movement is slightly checked by the effect of the small spring P3 L 63.

d) Lug P4 L 25 should have the minimum axial play. At the full extent of its downward play (without forcing it, to avoid bending its two arms) the lug should not slip off the lower end of shaft P4 EL 12. If this happens, however, bend the lower arm of the lug upwards. Check that it rotates freely.

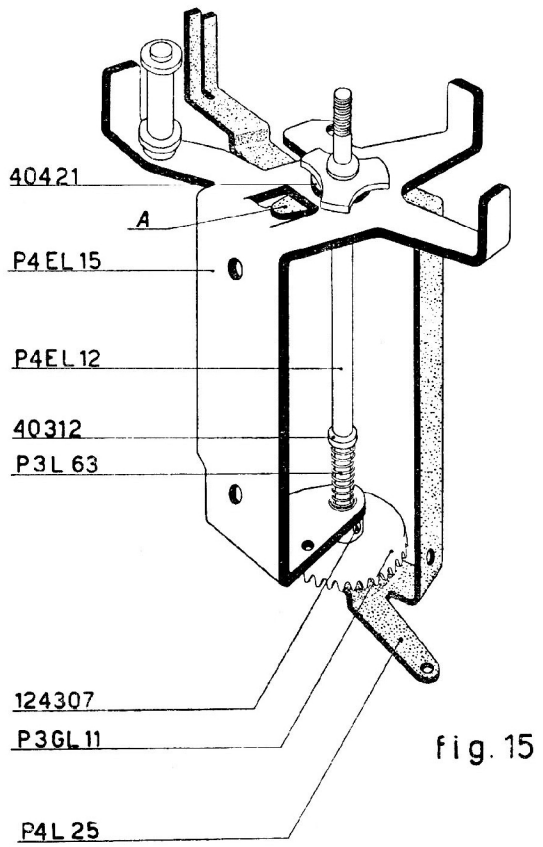


fig. 15

17 - FIGURE 16

Preparation of the right hand ribbon holder unit P4 BL 16.

The assembly order is the same as for the left ribbon holder unit described in the preceding paragraphs.

The only difference is that washer 40 31 2 and the small spring P3 L 63 are not fitted and in consequence the position of the crown wheel P3 GL 11 must be adjusted axially so as to leave shaft P4 EL 12 the minimum of axial play (0,05 mm.—0.002 of an inch.). Without the small spring, the play cannot be taken up and consequently reaches the value now given.

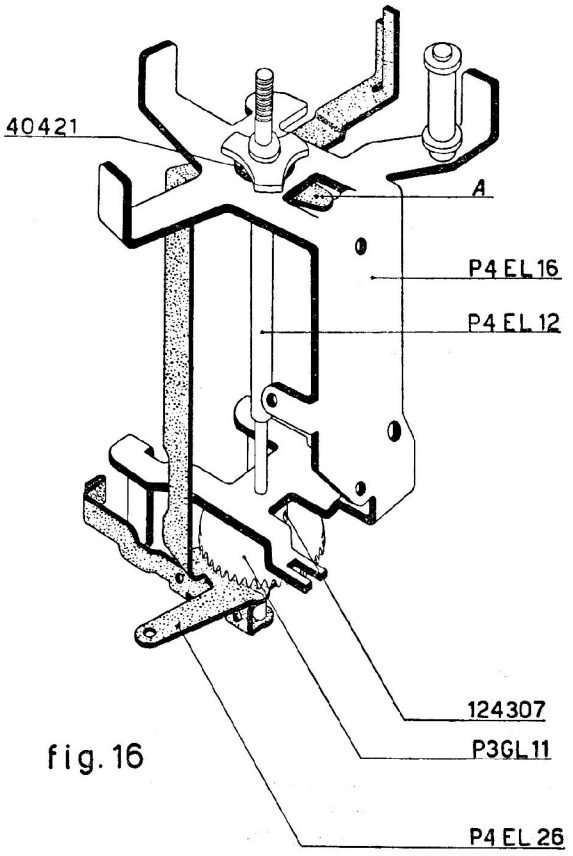


fig. 16

P4 L 25	Left hand reverse control lug
P4 EL 12	Spool shaft with plate
P4 EL 15	Left hand spool shaft bracket with roller
P4 EL 16	Right hand spool shaft bracket with roller and pallet
P4 EL 26	Right hand reverse control lug with trip pawl
P3 L 63	Spool braking spring
P3 GL 11	Ribbon feed crown wheel
124 30 7	Grub screw for P3 GL 11
40 31 2	Washer for P3 L 63
40 42 1	Washer for P4 EL 12

18 - FIGURE 17

a) Hook two springs M2 E 28 on the universal frame guide bracket P4 E 26.

b) On the rear part of the type bar segment P4 E 1, assemble bracket P4 E 26 with two screws 120 30 2 which should be partially screwed in and not locked.

c) Arrange the rubber stop bush P4 E 25 on the universal frame guide pin P4 E 24. The bush must be placed so that its larger internal diameter faces the back.

d) Screw in and lock securely the pin P4 E 24, already prepared, on the back of the type bar segment.

e) Assemble universal frame P4 GE 20 on pin P4 E 24. Make sure it slides freely.

f) Moving the bracket P4 E 26 as required, place the universal frame level with respect to the milling on the segment. The two extensions of the bracket should not foul the universal frame but should have a minimum clearance. The movement of the frame is thus unimpeded.

When these conditions have been reached, screw in screws 120 30 2.

g) Hook springs M2 E 28 to frame P4 GE 20 (hole **F**).

N. B. The function of stop bush P4 E 25 is to ensure the silencing of the universal frame against the segment; when at rest, there should be a clearance of 0,1 mm. (0.004 of an inch.) between frame and segment. This conditions is reached if the bush is carefully chosen or a washer 40 75 2 (of 0,1 or 0,2 mm. thickness—0.004 ÷ 0.008 of an inch.) placed under it.

19 - FIGURE 17

The wire pin of the second movement levers should be placed corresponding to the holes and the small wire pin anchoring plate P4 E 28/D and P4 E 28/S put in position. Secure them with screws 126 30 42 and leave them in the temporary position indicated in the figure.

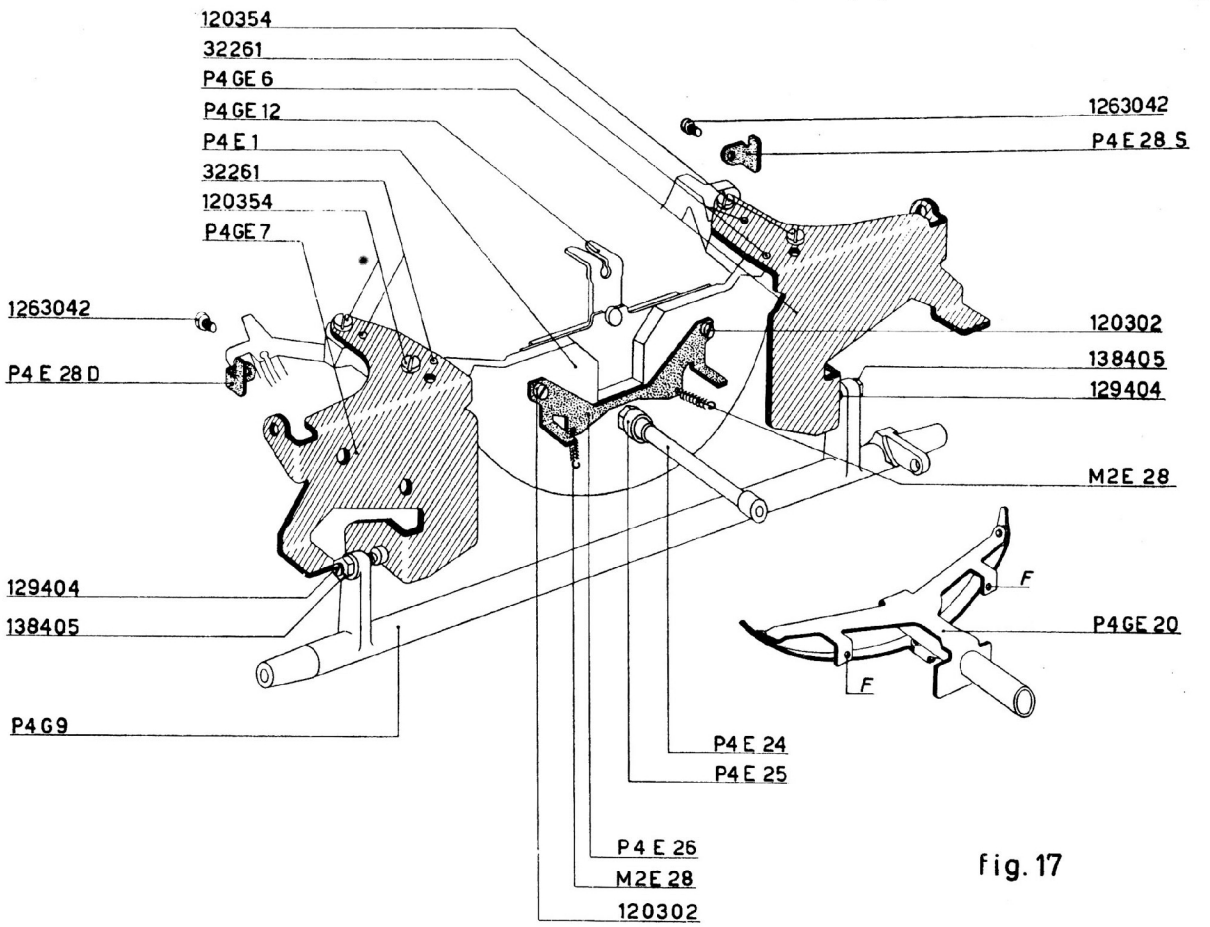


fig. 17

P4 E 1	Type bar segment	P4 GE 20	Universal frame complete
P4 E 24	Universal frame - guide pin	P4 G 9	Shift shaft with arms
P4 E 25	Universal frame - stop bush	M2 E 28	Spring for universal frame and carriage release
P4 E 26	Frame guide bracket	120 30 2	Cheese head screw for P4 E 26
P4 E 28 D	Wire pin anchoring plate - right hand	120 35 4	Cheese head screw for P4 GE 6 - P4 GE 7
P4 E 28 S	Wire pin anchoring plate - left hand	126 30 42	Shouldered screw securing P4 E 28 D-S
P4 GE 6	Left hand type bar segment support arm	129 40 4	Conical pivot screw for P4 G 9
P4 GE 7	Right hand type bar segment support arm	32 26 1	Dowel pin for P4 GE 6 - P4 GE 7
P4 GE 12	Type guide	138 40 5	Hexagonal nut for 129 40 4

20 - FIGURES 17 and 18

a) Screw the conical pivot screws 129 40 4 with their nuts 138 40 5 on the two long arms of the shift shaft P4 G 9.

b) These pivot screws should be lodged in the seats of the bushes fixed to the two lateral arms of segments P4 GE 6 and P4 GE 7.

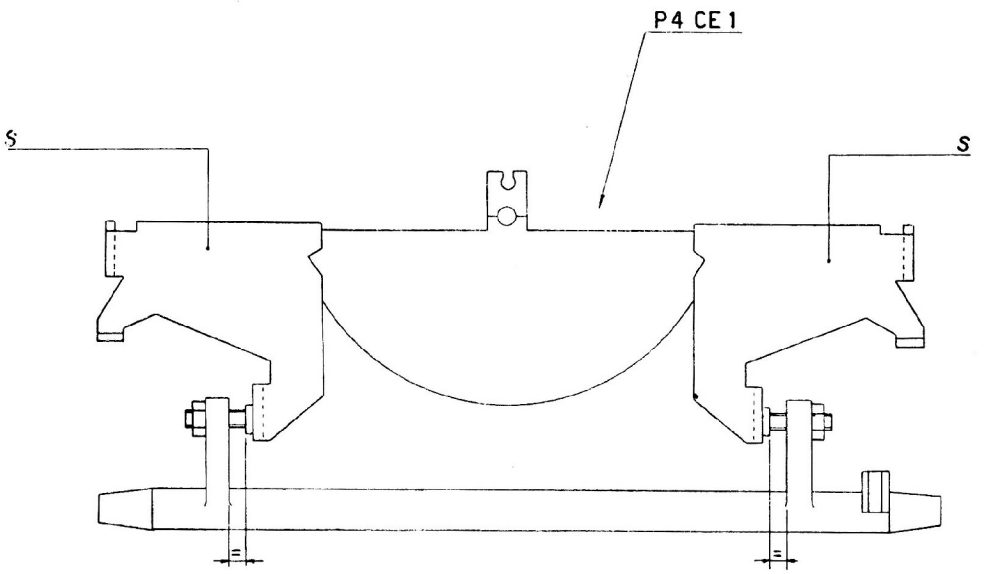
c) Adjust the position of the type bar segment with respect to shaft P4 G 9. The adjustment is effected by moving the two pivot screws 129 40 4 as required. The necessary conditions are as follows (figure 18):

— the two lateral brackets of the segment should be equally distant from the corresponding arms of shaft P4 G 9;

— the segment should have no axial play whatever with respect to shaft P4 G 9;

having reached these conditions, lock the nuts 138 40 5.

d) Lubricate the seats of the bushes where the conical pivot screws 129 40 4 are fitted.



P4 CE 1 Type bar segment complete

Fig. 18

21 - FIGURE 19

a) Assemble the ribbon carrier unit on the left hand side member of the machine, securing it with two screws 120 30 1.

b) Fit the type bar segment, with its shaft P4 G 9, between the two side members of the machine. The shanks **A** of the two lateral brackets of the segment should be positioned between the regulators **H** which have been previously mounted on the side members.

Secure the shaft with arm P4 G 9 by means of two conical pivot screws 129 40 4 and nuts 138 40 5.

c) Assemble the left segment suspension rod P4 E 15 on the left hand side member of the machine with a stud P4 E 18. Secure the rear end of the rod to the left bracket of the segment with another stud P4 E 18 and nut 138 35 1.

d) On the right hand side of the machine place the corresponding ribbon carrier unit in position securing it with two screws 120 30 1.

e) Assemble the right hand segment suspension rod P4 E 16 on the right hand side member of the machine with a stud P4 E 18. Secure the rear end of the rod to the right hand bracket of the segment with another stud P4 E 18 and nut 138 35 1.

f) Adjust the axial position of shaft P4 G 9. Since the type bar segment is already positioned by the two suspension rods P4 E 15 and P4 E 16, P4 G 9 should be secured in the position it reaches naturally. Adjust the conical pivot screws 129 40 4 as required so as to leave P4 G 9 with a slight axial play. This play has to be checked again when the carriage has been placed into position.

Having adjusted to the desired condition, tighten nuts 138 40 5 on pivot screws 129 40 4.

Check that the type bar segment moves freely.

g) Hook spring 62 60 12/P between the bracket of the right hand ribbon carrier unit and the right hand bracket of the segment.

h) Hook spring P3 G 20 between the bracket of the left hand ribbon carrier unit and the left hand bracket of the segment. This spring is not quite as strong as 62 60 12/P.

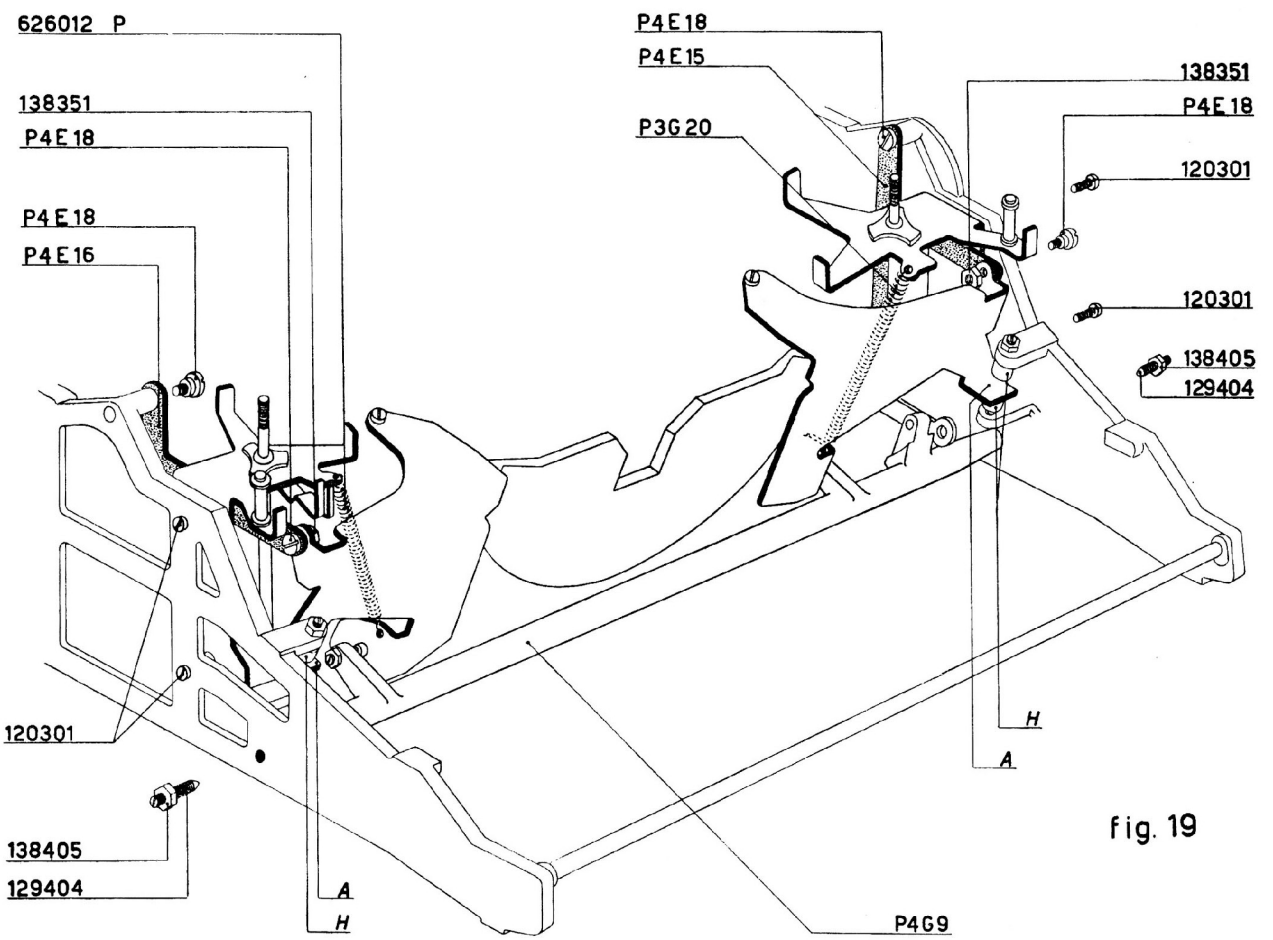


fig. 19

P4 E 15	Type bar segment suspension rod - left hand	P3 G 20	Suspension spring - left hand
P4 E 16	Type bar segment suspension rod - right hand	120 30 1	Cheese head screws for P4 EL 15 - P4 EL 16
P4 E 18	Special stud for segment suspension rod	129 40 4	Conical pivot screw for P4 G 9
P4 G 9	Shift shaft with arms	138 35 1	Hexagonal nut for P4 E 18
		138 40 5	Hexagonal nut for 129 40 4
		62 60 12/P	Segment suspension spring - right hand

22 - FIGURE 20

a) Place jig UG 805 in position on the left hand side member of machine so that:

— the head of the lower screw holding the side member to the key lever support is inserted in the hole **F**;

— the pin **P1** is lodged in the hole where the shaft for ribbon feed and reverse will be placed later;

— pin **P** is inserted in the hole in arm **B** of shaft P4 G 9.

b) This operation determines the position of the type bar segment for the " small letters ".

By manipulating the regulator P4 G 11 as required, bring the rubber cap P4 G 12 into contact with shank **A** of the left hand bracket of the type segment.

The same operation must be carried out on the right hand regulator P4 G 11.

c) Remove jig UG 805.

d) Check that the two rubber caps P4 G 12 are level with respect to the stop shanks of the two lateral segment brackets.

A paper feeler 0,08 mm. (0.0031 of an inch.) thick should be held between the parts making contact.

If necessary adjust the position of the right hand regulator; the left hand regulator should not be touched.

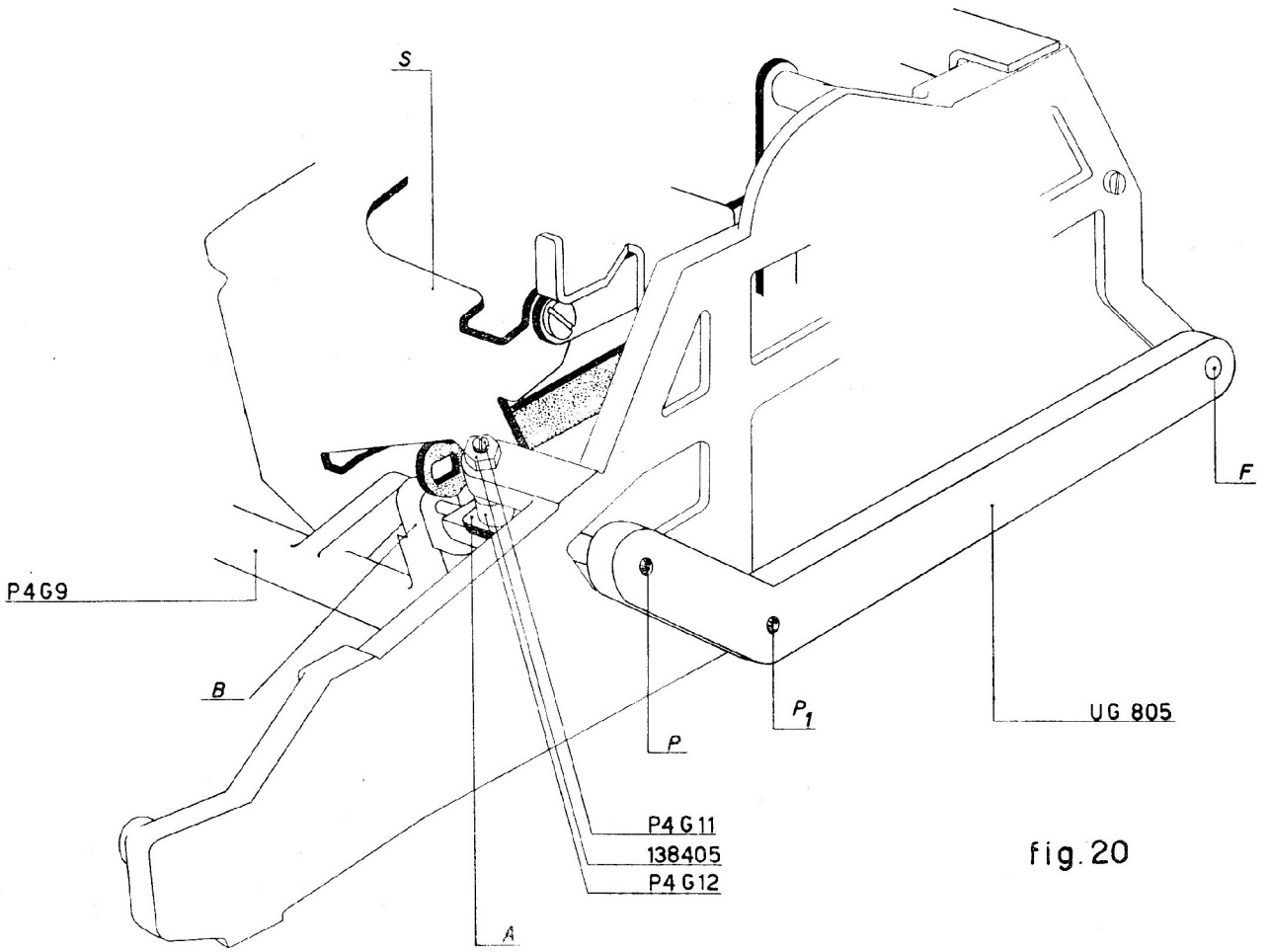


fig. 20

P4 G 9	Shift shaft with arms	UG 805	Jig for regulating the segment for " small letters "
P4 G 11	Shift regulator		
P4 G 12	Rubber cap for shift regulator	138 40 5	Hexagonal nut for P4 G 11

23 - FIGURE 21

a) Leave the type bar segment in position for small letters.

b) A 6,6 mm. (0.25984 of an inch.) feeler (UG 802/33) should pass not too easily between the lower rubber cap P4 G 12 and shank **A** of the left hand bracket **S** of the type bar segment. This condition is reached by moving the lower regulator as required.

c) The same operation must be carried out between the lower rubber cap on the right and the stop shank of the right hand bracket of the type bar segment.

N. B. The thickness of 6,6 mm. (0,25984 of an inch.) represents the distance travelled by the type bar segment from the position for small letters to the position for capitals.

24 - FIGURES 22 and 22a

a) Hook spring P4 G 13 between the lower bend of the left hand spool shaft bracket P4 L 15 and the rear bend of the left hand lever of the shift frame P4 GG 3.

b) Connect the shift pull rod P4 G 4 to arm **B** of shaft P4 G 9 with the eccentric stud M3 Q 10 and nut 138 30 5.

c) Adjust the eccentric M3 Q 10 temporarily so that during the shift, the lower shank **A** of rod P4 E 15 does not foul the back bend of the left hand lever of shift frame P4 GG 3; use a nut 138 30 5 which should not be screwed down tightly.

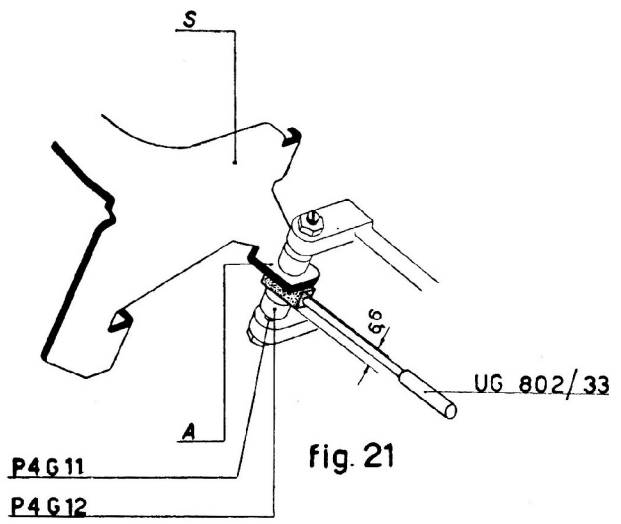


fig. 21

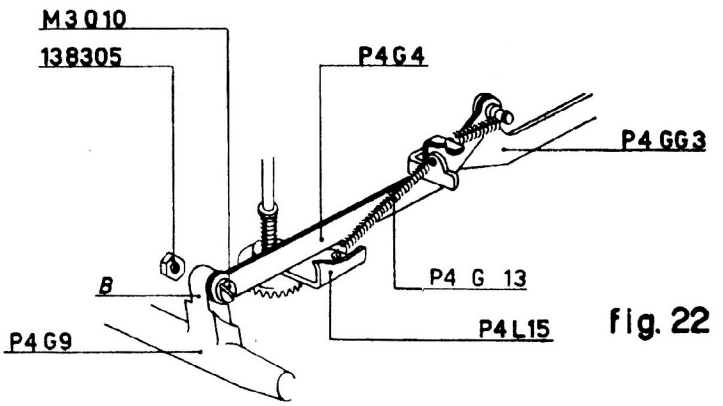


fig. 22

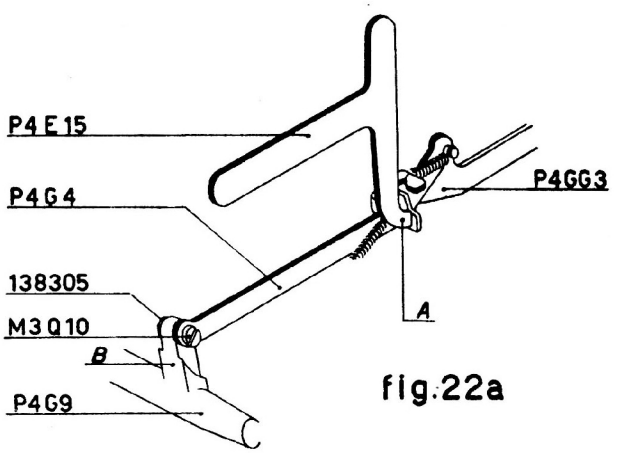


fig. 22a

P4 E 15	Left hand typebar segment suspension rod	
P4 G 4	Shift pull rod	
P4 G 9	Shift shaft with arms	
P4 G 11	Shift regulator	
P4 G 12	Rubber cap	
P4 G 13	Spring for P4 GG 3	
P4 GG 3	Shift frame	
P4 EL 15	Left hand spool shaft bracket	
M3 Q 10	Connecting stud for P4 G 4	
UG 802/33	Feeler for checking segment travel	
138 30 5	Hexagonal nut for M3 Q 10	

25 - FIGURES 23 and 23a

a) Place the machine with the right hand side on the work bench and the keyboard facing the right.

b) Proceed with the hooking up of the first movement links P4 B 24/... and the assembly of the second movement levers P4 B 26 in the following order:

— hook a first movement link P4 B 24/... to first movement lever P4 B 23/1, i. e. the first on the left. The eye of the link, as seen in the figure, should be turned towards the outside of the machine. Its bend should be turned towards the operator; the links for first movement levers P4 B 24/2 of 8 and 9 levers must be crossed (page 99);

— hook a second movement lever P4 B 26 to the other eye of the link P4 B 24/... Lodge the lever in the corresponding guide slot of the type bar segment.

c) Starting with the second of the first movement levers P4 B 23/2 and continuing to the twenty-second P4 B 23/22 (corresponding to the letter h on the standard keyboard) the hooking up of the links is in the opposite direction. Their bends, however, should always be turned towards the operator.

d) Insert the temporary wire pin UA 8058/9 (2.6 mm.—7/64"—diameter) and advance it little by little until the twenty-two second movements levers now mounted are hinged on it.

e) Place the machine on ist left hand side with the keyboard facing the left. Assemble the twenty-one second movement links and the twenty-one levers in the same order as given above. The first link of the first movement lever P4 B 23/43 should have its loops turned towards the outside of the machine. The other twenty-one links should be hooked on in the opposite direction. Their bends should always be turned towards the operator.

f) Advance the temporary wire pin further so that the forty-three first movement levers are hinged on it. Then introduce the proper wire pin P4 B 29, and withdraw the temporary one at the same time.

g) Turn the plates P4 E 28 S and P4 E 28 D, previously placed in position, until they reach the position shown in figure 23a. The wire pin P4 B 29 is thus locked in its seat. Screw up tightly screws 126 30 42.

26 -

Assemble in correct order on the levers composing the keyboard:

— the back space key P3 GN 12;
— the margin release key P3 Q 11;
— the tabulator key P3 V 4;
— the two shift keys M2 G 25;
— the shift lock key M2 G 26;
— the forty-three caps M2 GB 30.

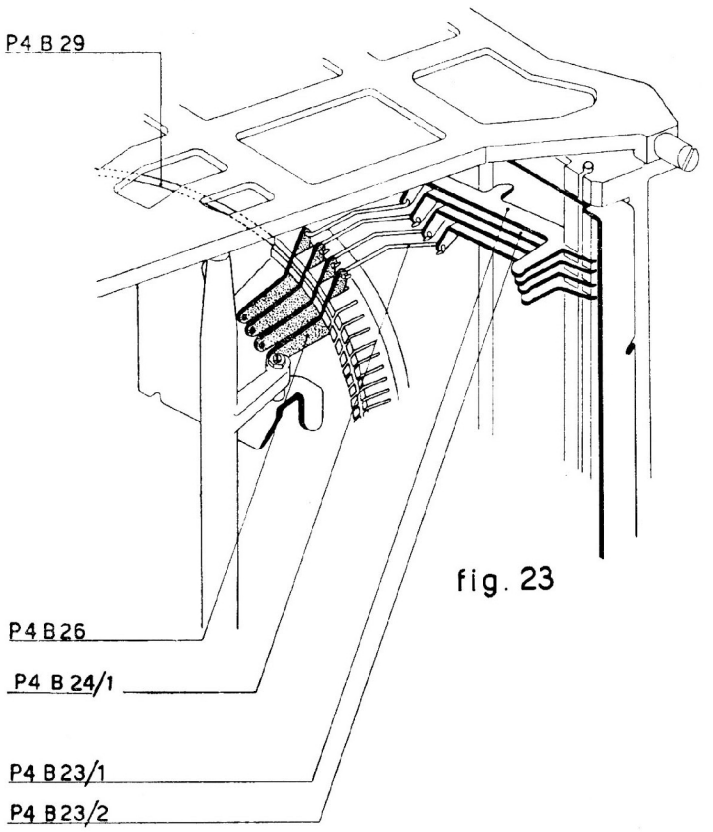


fig. 23

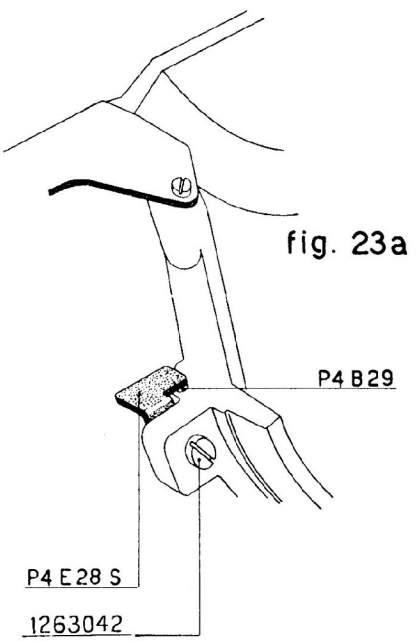


fig. 23a

P4 B 23/1 ÷ 43	First movement levers
P4 B 24/1	Links for first movement levers
P4 B 24/2	Links for first movement levers (8 and 9
P4 B 26	Second movement levers

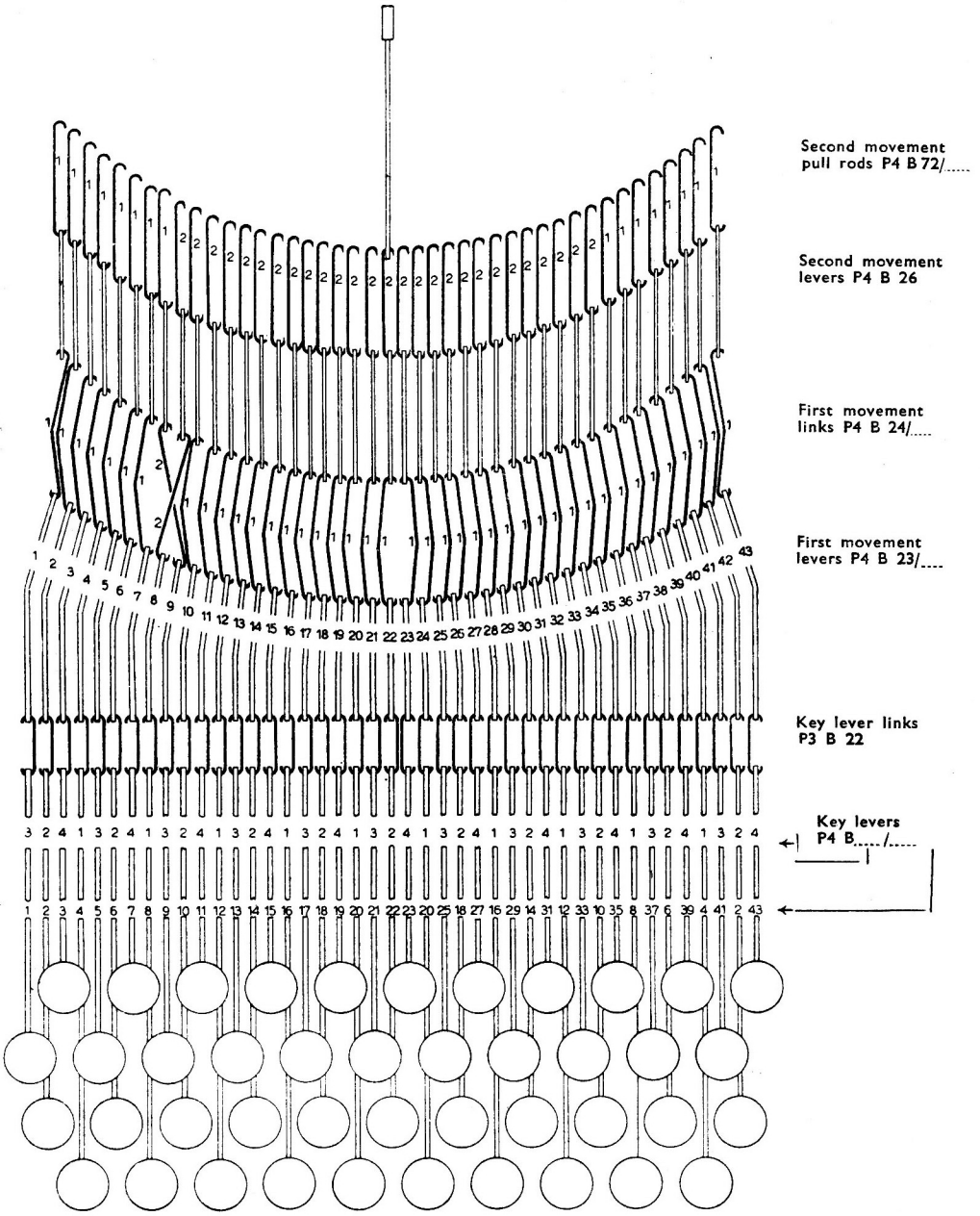
P4 B 29	Wire pin for second movement levers
P4 E 28 S	Wire pin anchor plate - left hand
P4 E 28 D	Wire pin anchor plate - right hand
126 30 42	Threaded pin for P4 E 28 S and P4 E 28 D

27 -

Hooking up the second movement pull rods and assembling the type bars. The second movement pull rods are of two types: the standard P4 B 27/1 and P4 B 27/2 with the small milled hook. The standard ones are assembled on the lateral cinematic movements on the first eight on the left and on the last eight on the right. The pull rods P4 B 27/2 are used for the other twenty-seven cinematic movements.

There are forty-three type bars; they are numbered progressively starting from the left. Their base code symbol is P4 E 3/... followed by the figure which identifies their position.

P4 B 23/1 ÷ 43	First movement levers
P4 B 24/1	First movement links
P4 B 24/2	Links for first movement levers 8 and 9
P4 B 26	Second movement levers
P4 B 27/1	Second movement pull rods for keys 1 ÷ 8 and 36 ÷ 43
P4 B 27/2	Second movement pull rods for keys 9 ÷ 35
P3 B 22	Key lever links


Second movement pull rods P4 B 72/.....
Second movement levers P4 B 26
First movement links P4 B 24/....
First movement levers P4 B 23/....
Key lever links P3 B 22
Key levers P4 B...../.....

a) Place the machine with the keyboard turned towards the operator.

b) Start assembling beginning with the first cinematic movement on the right. Proceed in the following order:

— lower the key so as to raise the second movement lever P4 B 26;

— hook the second movement pull rod on to it, in the direction shown in the figure;

— hook the other eye of the pull rod, to the corresponding type bar;

— keep the key lowered and insert the type bar in the corresponding guide slot of the segment;

— introduce and advance the temporary wire pin UA 8058/8 until the type bar already in position is hinged on it.

c) Continue assembling the type bars in the same order, proceeding towards the left.

d) Replace the temporary wire pin with permanent pin P4 E 2.

e) Check the perfect freedom of movement of each type bar, in its guide slot. Also check that each type bar reaches the type guide without obstruction.

f) Loosen the rear screws 120 35 4 which hold the lateral bracket to the type bar segment (figure 24a).

Place the wire pin anchor plate P4 E 27 under these screws in the direction indicated in the same figure. Tighten up screws 120 35 4.

The wire pin for the type bars is thus locked in position.

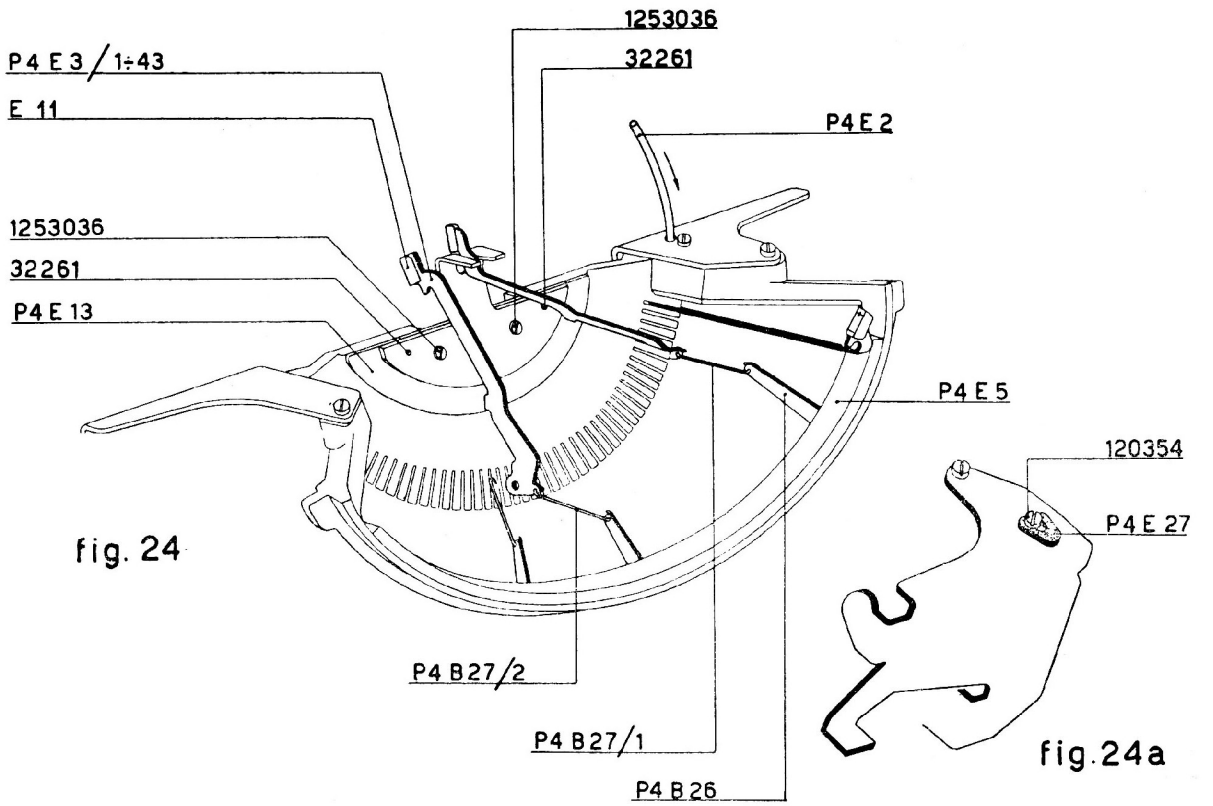


fig. 24

fig. 24a

P4 B 26	Second movement levers	P4 E 5	Type bar rest bearing
P4 B 27/1	Second movement pull rods for keys 1 ÷ 8 and 36 ÷ 43	P4 E 13	Metal stop plate
		P4 E 27	Wire pin anchor plate
P4 B 27/2	Second movement pull rods for keys 9 ÷ 35	E 11	Type
		120 35 4	Cheese head screw for P4 E 27
P4 E 2	Wire pin for type bars	125 30 36	Special screw for P4 GE 12
P4 E 3/1 ÷ 43	Type bars	32 26 1	Dowel pin for P4 GE 12

28 - FIGURE 25

a) Place the machine in the position shown in the figure.

b) Place the connecting cross piece P4 E 4 on the two lateral brackets of the type bar segment. Its front shank should barely touch the wire pin of the second movement levers. The slot should be centered in relation to the middle second movement lever.

Secure the cross piece with two screws 120 30 3 with the washer 40 31 2.

29 - FIGURE 26

Adjusting the cinematic chain.

a) First of all, operate the shift. If on changing from small letters to capitals and vice versa, some of the type bars remain on the felt rest, it means that the connecting cross piece P4 E 4 is pressing on the segment. An adjustment must be made so that its front shank is kept slightly away from the wire pin of the second movement levers.

b) The positioning of the cinematic chain is correct when:

— the type bars reach the platen on striking the keys lightly;

— the type bars rest on the felt support in both the capitals and small letter positions;

— if the type bar is held back, the corresponding key makes an idle stroke of 1 ÷ 1,5 mm. (0,04 ÷ 0.055 of an inch.);

— if the type bar in a cinematic chain does not reach the platen, it means that the corresponding key has too great an idle stroke and the bend of the first movement link P4 B 24/... must be decreased by means of a hand setting tool.

The same operation must be carried out even if the type bar reaches the platen when the corresponding key has a greater idle stroke than stated. If on changing from small letters to capitals and vice versa, the type bar remain on the felt, it means that the keys have no idle stroke. It is then necessary to increase, with the aid of the hand setting tool, the bend in the first movement link P4 B 24.

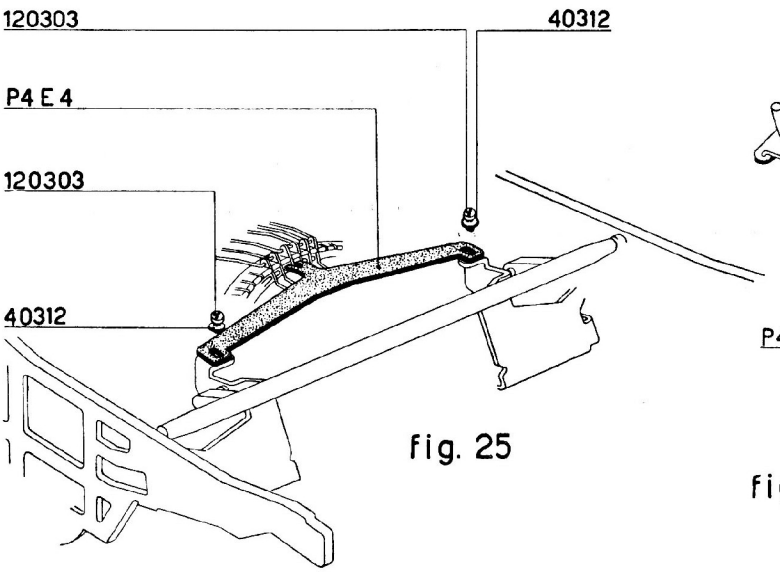


fig. 25

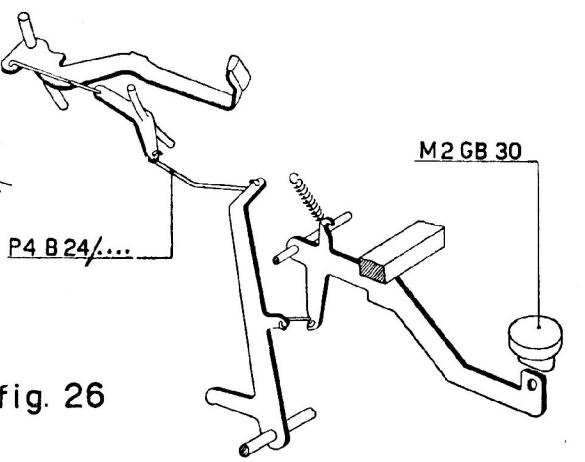


fig. 26

P4 B 24/...	First movement link	120 30 3	Cheese had screw for P4 E 4
P4 E 4	Connecting cross piece	40 31 2	Washer for 120 30 3
M2 GB 30/...	Key tops		

30 - FIGURES 27 and 27a

Fit the two ribbon feed springs P4 L 104 on the right hand pinion of the ribbon feed P4 GL 15, to their corresponding anchorages. Position them as indicated in the figure and be very careful when assembling them not to subject them to the slightest distortion.

Turn the springs to close their coils and check that the pinion is pulled by the rotation.

Fit the assembled pinion in the ribbon feed frame P4 L 103.

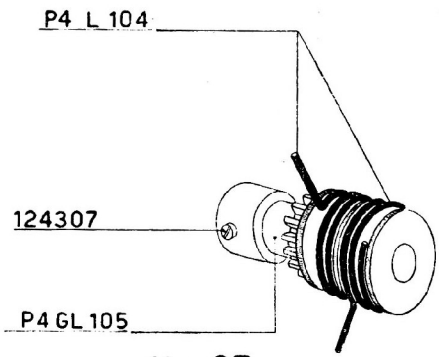


fig. 27

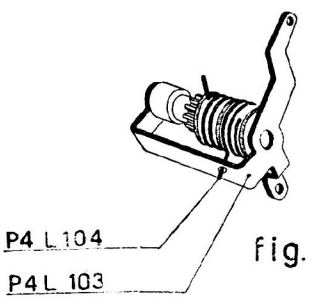


fig. 27a

The bent end of the outer spring should be inserted into the hole specially drilled in the frame.

31 - FIGURE 28

On the ribbon feed horizontal shaft P4 L 8, place in the following order:

— the left hand ribbon feed pinion P3 L 33 with its screw 124 30 7;

— the circular cam for the reverse trip P3 L 31 with its screw 124 30 7.

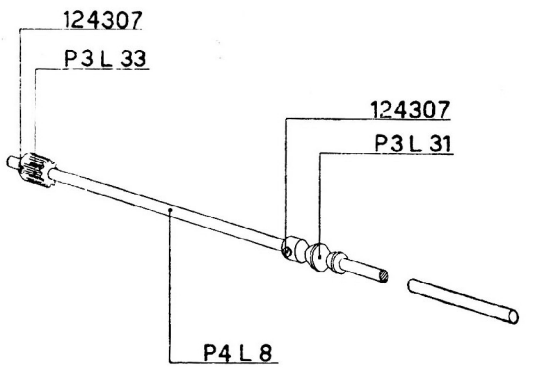


fig. 28

P4 L 8	Ribbon feed horixontal shaft
P4 L 103	Ribbon feed frame
P4 L 104	Ribbon feed spring
P4 GL 105	Right hand ribbon feed pinion complete
P3 L 31	Circular cam for reverse trip
P3 L 33	Left hand ribbon feed pinion
124 30 7	Grub screw for P3 L 33 - P3 L 31 - P4 GL 105

32 - FIGURES 29 and 30

a) Position the unit formed by the right hand pinion P4 GL 105 and the frame P4 L 103 in relation to the ribbon feed crown wheel of the right hand ribbon carrying unit.

Hook pull rod P3 L 2 to the frame P4 L 103.

b) Arrange the bent end of the inner spring P4 L 104 in the special slot **A** filed in one of the shanks of the right hand ribbon carrying shaft bracket P4 EL 16.

c) Fit the right hand end of the shaft P4 L 8 in the frame P4 L 103 and the pinion P4 GL 105. Advance this shaft further so that it is inserted in the special guide opening made in the right hand side member of the machine.

d) The left hand end of the shaft P4 L 8 is lodged in the corresponding opening made in the left hand side member of the machine.

e) Connect the two lugs controlling the ribbon reverse **B** and **B1** with the pull rod P4 L 27.

f) Hook spring 60 20 9 between the frame P4 L 103 and the right hand spool shaft bracket P4 EL 16.

fig. 29

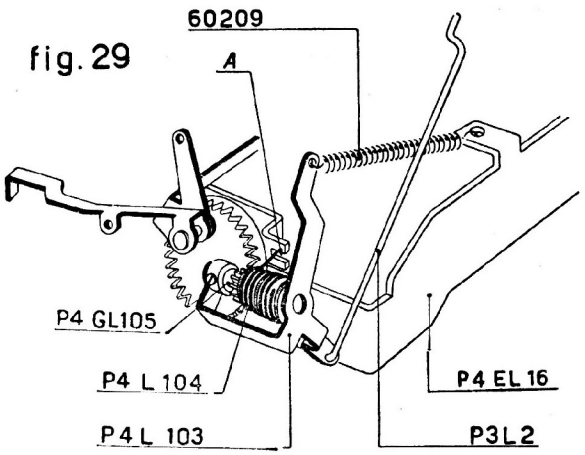
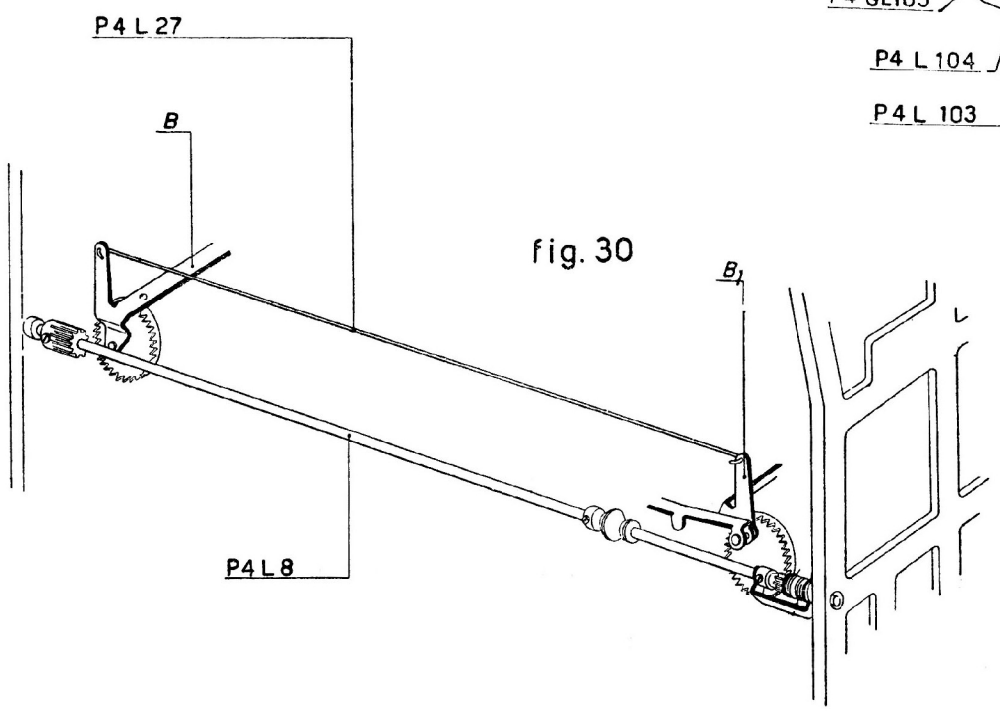


fig. 30



P4 L 8	Horizontal ribbon feed shaft	P4 GL 105	Right hand ribbon feed pinion complete
P4 L 27	Lug connecting pull rod		
P4 L 103	Ribbon feed frame	P3 L 2	Pull rod controlling ribbon feed
P4 L 104	Ribbon feed spring	60 20 9	Spring for P4 L 103
P4 EL 16	Right hand spool shaft bracket		

33 - FIGURES 31 - 32 - 33 and 34

Adjustment of the ribbon feed and reverse.

a) Centralise shaft P4 L 8 in relation to the side members of the machine. With the shaft in this position, bring the pinion P3 L 33 and the frame P4 L 103 to 1 mm. (0.04 of an inch.) of the respective sides (figure 31). Tighten screws of pinion P3 L 33 and P4 GL 105 partially without locking them.

b) Check the reciprocal position of the two lugs **B** and **B1** (figure 32). It should be the right hand lug **B** which stops against the corresponding bracket P4 L 16. In the two positions, the left hand lug **B1** should have a safety clearance from the corresponding bracket P4 EL 15. This clearance should be the same from both sides.

This condition obtains in almost every case. If required, it can be attained by correcting the angle between the upper and lower arms of the right hand lug **B**. If this has to be done, check again afterwards on the rotational freedom of the lug and in addition, make sure that its axial play is a minimum.

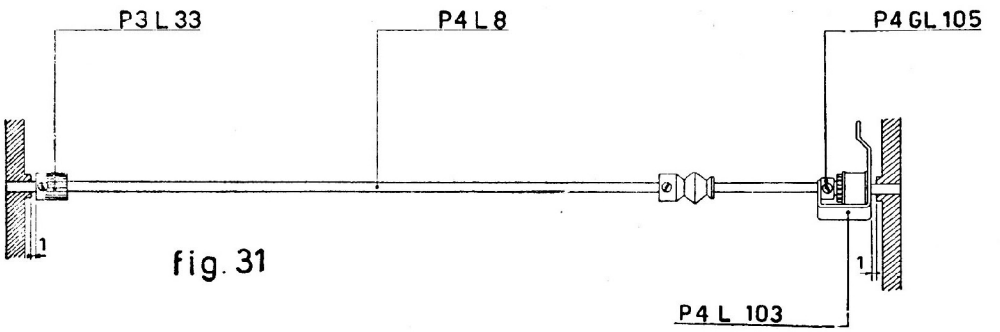


fig. 31

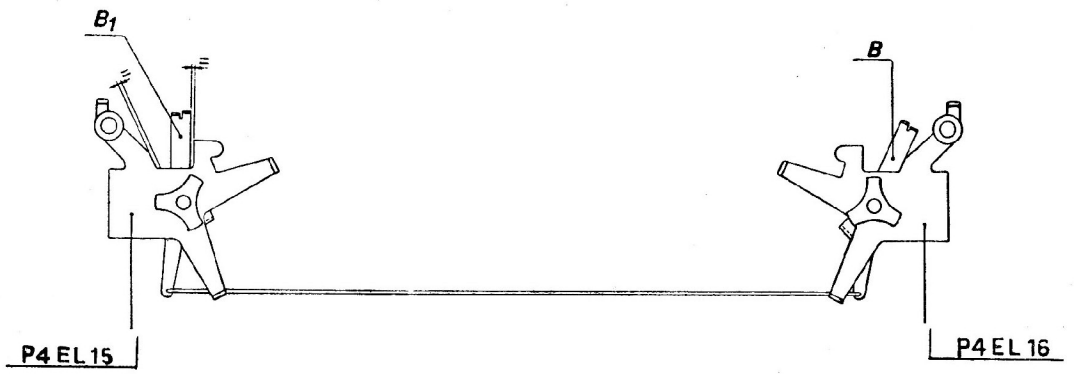


fig. 32

P4 L 8	Horizontal ribbon feed shaft	P4 GL 105	Right hand ribbon feed pinion complete
P4 L 103	Ribbon feed frame		
P4 EL 15	Left hand spool shaft bracket	P3 L 33	Left hand ribbon feed pinion
P4 EL 16	Right hand spool shaft bracket		

c) Hook spring 63 30 4 between the positioning piece **P** and the hook **G** of the right hand spool bracket.

Move shaft P4 L 8 to the right so that the frame P4 L 103 touches the right hand side member of the machine.

The left hand pinion P3 L 33 will mesh with the corresponding crown wheel P3 GL 11 (figure 33).

Check that the teeth of the pinion P3 L 33 engage the entire width of the teeth of crown wheel P3 GL 11. If necessary, correct the position of the pinion in relation to shaft P4 L 8.

d) Move the pull rod P4 L 27 in the direction shown by the arrow, so that the lug of the ribbon carrying unit contacts the corresponding bracket.

Move the circular cam for the reverse trip P3 L 31 along shaft P4 L 8 as required. It should take the position shown in figure 33. The left hand collar should be centered in relation to the bend in the position piece **P**.

Check that the latter rests on leg **G1** of the right hand ribbon carrying bracket; there should be a safety clearance of 0,2 mm. (0.008 of an inch.) between the bent end and the bottom of the collar groove of cam P3 L 31. If necessary, adjust the bend in leg **G1** with moderate pressure.

Taking up the play of shaft P4 L 8, and play allowed by cam P3 L 31, check that pinion P3 L 33 does not slip out of the crown wheel P3 GL 11.

e) Check the meshing between the pinion P3 L 33 and crown wheel P3 GL 11. They should engage about half the depth of a tooth.

If the meshing is not found to be as stated (figure 34):

— raise or lower the lower bend **P** of bracket P4 EL 15 and raise or lower the crown wheel P3 GL 11 the same amount. In this way the axial play of 0,6 mm. (0.024 of an inch.) prescribed for the left hand shaft P4 EL 12 remains unaltered.

f) Operate the ribbon reverse, moving the lug as required. The engagement is now on the right. Repeat the same series of operations and checks, as given, for the left hand side engagement.

N. B. Remember that the axial play of shaft P4 EL 12 of the ribbon carrying unit should be 0,05 mm. (0.002 of an inch.).

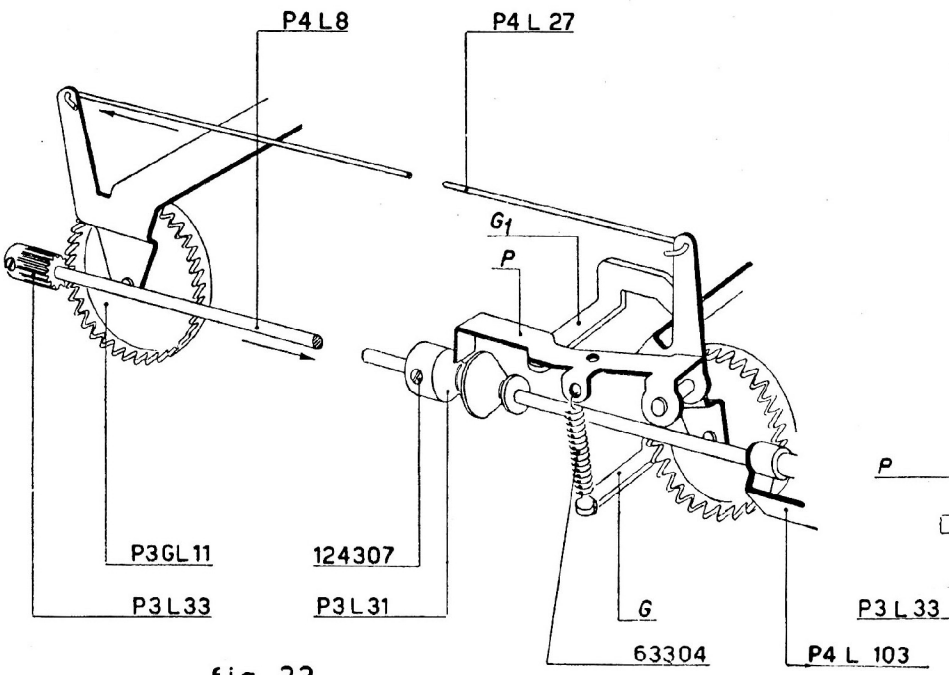


fig. 33

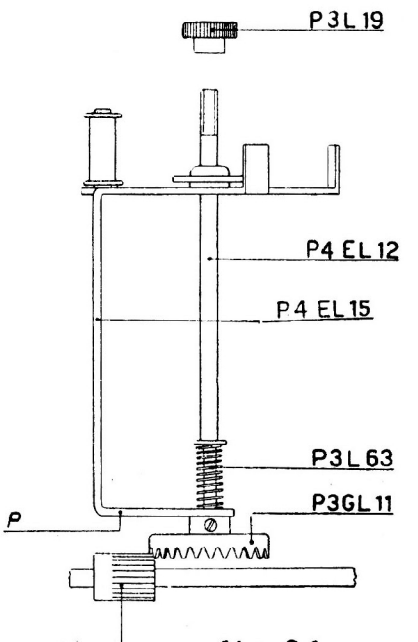


fig. 34

P4 L 8	Horizontal ribbon feed shaft	P3 L 31	Circular cam for reverse trip
P4 L 27	Pull rod connecting lugs	P3 L 33	Left hand ribbon feed pinion
P4 L 103	Ribbon feed frame	P3 L 63	Spool braking spring
P4 EL 12	Spool shaft with plate	P3 GL 11	Ribbon feed crown wheel
P4 EL 15	Left hand spool shaft bracket	124 30 7	Grub screw for P3 L 31
P3 L 19	Button securing spool	63 30 4	Spring for P4 L 29

34 - FIGURES 35 and 36

a) Place in the following order on the ribbon carrier shaft P4 L 48:

— collar 142 51 6 with corresponding screw 120 30 14;

— the space bar control frame P4 H 3;

— the second crank of the ribbon carrier P4 GL 49 with corresponding screw 125 30 26;

— the clamp of the first ribbon carrier crank and pull rod P4 EL 46 with corresponding screw 125 30 26.

b) Hook the spring P4 L 52 between the pull rod P4 EL 46 and the flexible coupling.

c) Screw two conical pivot screws 129 40 4 with their nuts 138 40 5 on to the two side members of the machine. Place shaft P4 L 48 ready assembled between these two screws. The crank P4 GL 49 and the pull rod P4 L 46 should be in the positions shown in figure 35. Centre the shaft P4 L 48 between the two sides by adjusting the two regulators 129 40 4 as required. Its axial play should be a minimum and it should rotate with perfect freedom. Having reached this condition, lock both nuts 138 40 5 of pivot screws 129 40 4.

d) Connect the pull rod P4 EL 46 to the two-colour change lever P4 GL 44 with the link P3 B 22 (figure 36).

fig. 35

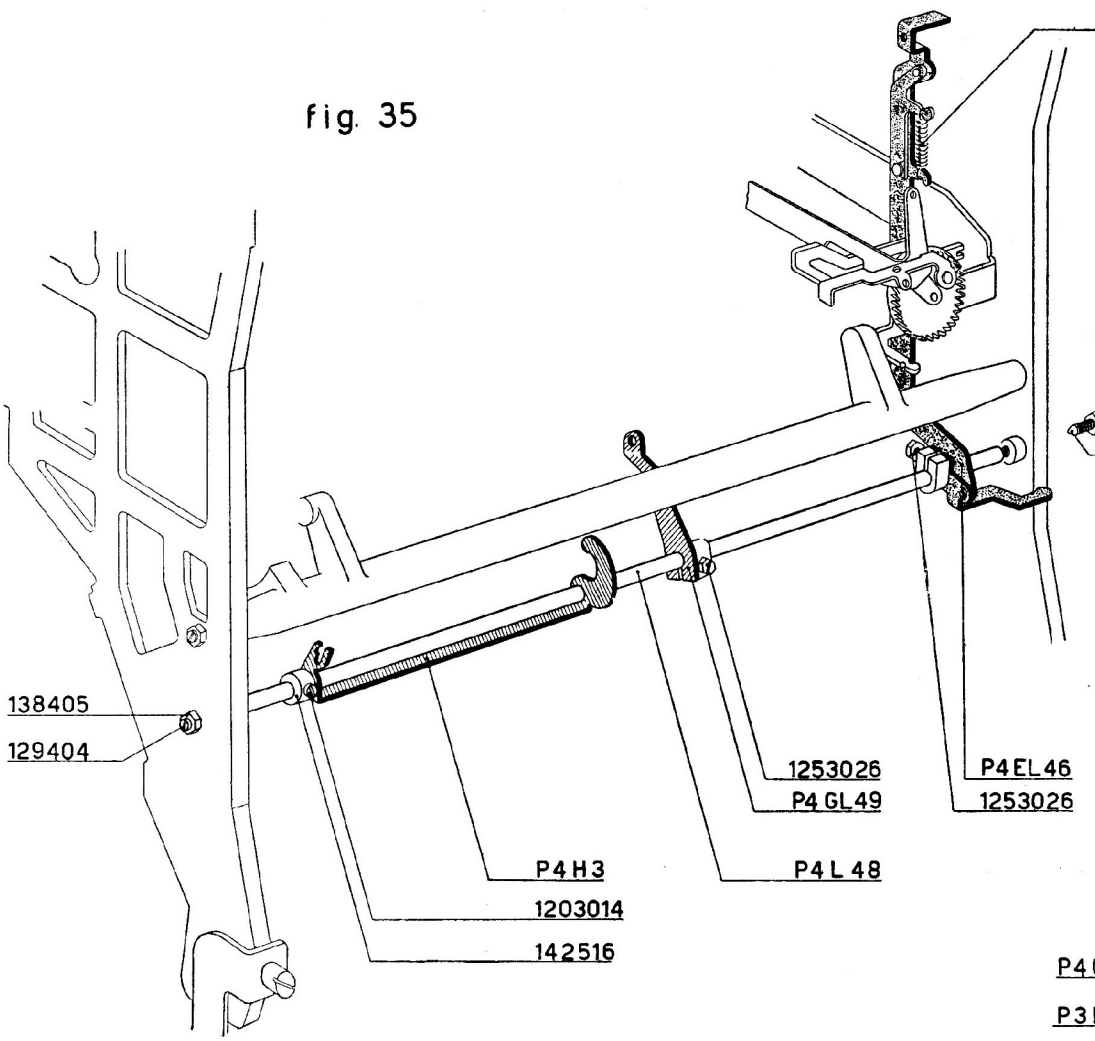
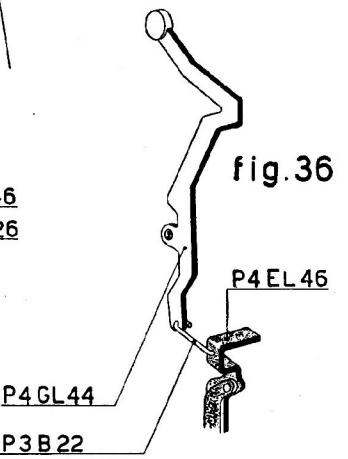


fig. 36



P4 H 3	Space bar control frame	P3 B 22	Links for key levers
P4 L 48	Ribbon carrier shaft	120 30 14	Cheese head screw for 142 51 6
P4 L 52	Spring for P4 EL 46	125 30 26	Special screw for P4 GL 49 - P4 EL 46
P4 GL 44	Two-colour change lever	129 40 4	Conical pivot screw for P4 L 48
P4 EL 46	First ribbon carrier crank with pull rod	138 40 5	Hexagonal nut for 129 40 4
P4 GL 49	Second ribbon carrier crank	142 51 6	Collar for P4 H 3

35 - FIGURE 37

Connect the lever P4 GH 7 to the space bar frame P4 H 3 by means of link P4 H 8. The latter should be placed as shown in the figure. Close the slots of P4 H 3 and P4 GH 7 with pliers so as to secure the link.

Move lug **B** of the left hand ribbon carrying unit counter clockwise. Check that it does not foul link P4 H 8. Adjust the collar 124 51 6 if necessary. A spring which will be hooked in later, will hold frame P4 H 3 in contact with the collar.

Furthermore, make sure that the inside shank of frame P4 H 3 is engaged with stop **A** of the universal frame P4 GE 20. Tighten screw 120 30 14 of collar 142 51 6.

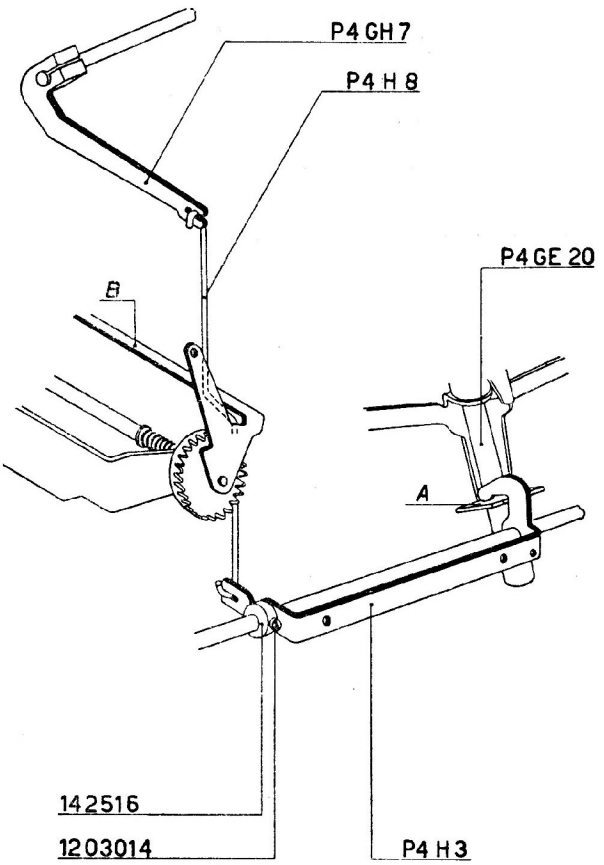


fig. 37

P4 GE 20	Universal frame complete
P4 H 3	Space bar control frame
P4 H 8	Spacer link
P4 GH 7	Spacer control lever
P4 GL 49	Second ribbon carrier crank

36 - FIGURE 38

a) Place the ribbon carrier P4 GL 51 in position on the special rear pin of the type guide. Place its lower leg in the hole in second ribbon lift crank P4 GL 49. Secure it with a flexible clip 45 22 1.

b) Check that screw 125 30 26 of crank P4 GL 49 is loose and that the crank itself is free to rotate on its shaft.

c) Check that the movement of the ribbon carrier is perfectly free.

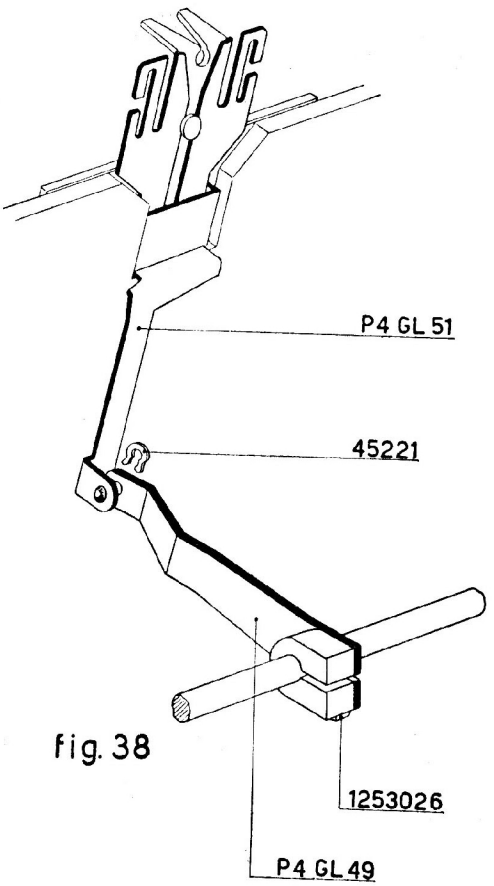


fig. 38

P4 GL 51	Ribbon carrier
120 30 14	Cheese head screw for 142 51 6
125 30 26	Special screw for P4 GL 49
142 51 6	Collar for P4 H 3
45 22 1	Flexible clip for P4 GL 51

37 - FIGURES 39 - 39a and 39b

a) Hook the pull rod P3 L 2 to the right arm of the lug controlling the ribbon movement P4 BL 1 and place the latter in position between the two sides of the machine. The slot of the right arm is fitted on pin **P** of pull rod P4 EL 46. Secure lug P4 BL 1 on the left hand side with stud 126 30 41 and on the right hand side with stud 126 3033.

b) Check that the rear shanks of the first movement levers rest on the lug. If necessary adjust so that the latter is made level.

c) Hook spring P4 L 14 between the left arm of the lug and the crank P4 GB 31 (figure 39b).

38 - Mount the ribbon spools on their small shafts and secure them with the buttons P3 L 19. Arrange ribbon in the ribbon carrier. Test ribbon feed and reverse.

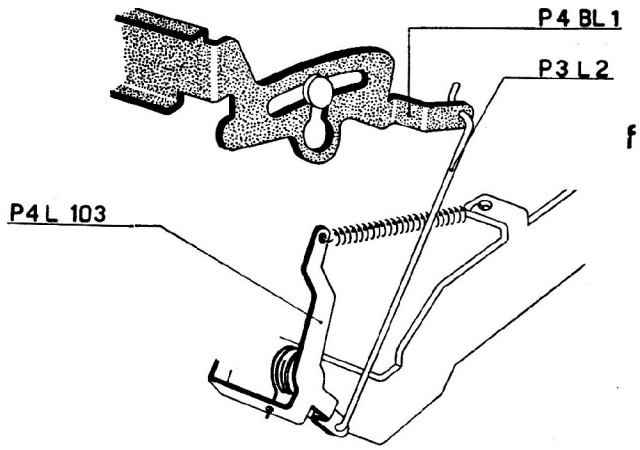


fig. 39a

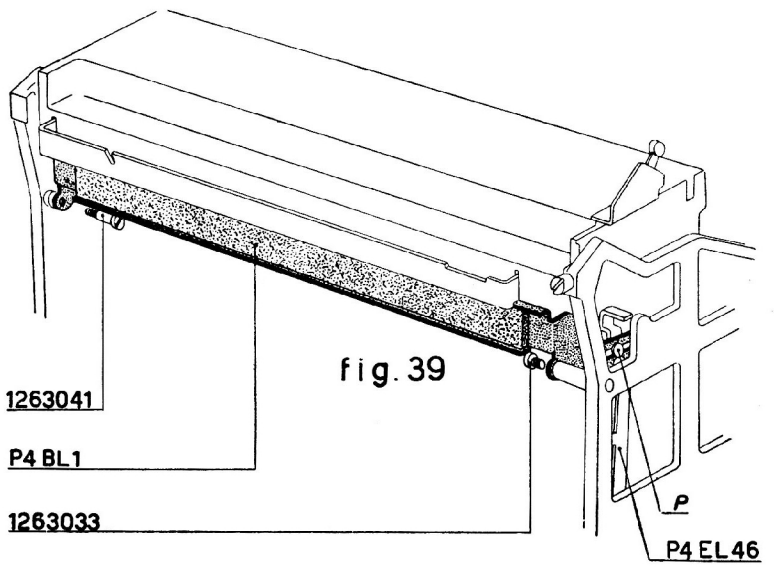


fig. 39

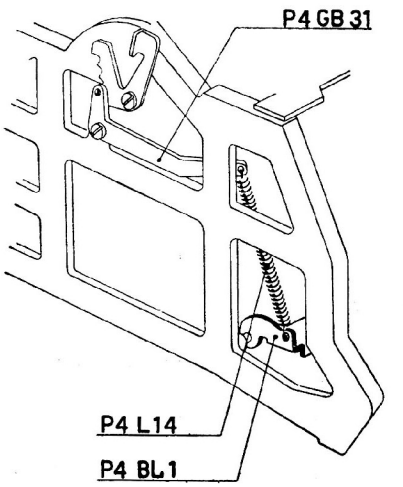


fig. 39 b

P4 GB 31	Crank for touch control spring	P4 EL 46	1st ribbon carrier crank with pull rod
P4 L 14	Spring for lug	P3 L 2	Pull rod controlling ribbon feed
P4 L 103	Ribbon feed frame	126 30 33	Threaded pin for P4 BL 1
P4 BL 1	Lug controlling ribbon movement with felt	126 30 41	Threaded pin for P4 BL 1

39 - FIGURE 40 - 40a and 41

a) On tabulator controlling shaft P4 V 15 mount in the following order:

— the setting and clearing crank P4 GV 23 with its screw 125 30 26;

— the margin release bracket P4 Q 2 is placed astride the crank;

— the clearing and setting control P4 GV 30 with its screw 125 30 26;

— the left hand bent arm of the clearer P4 V 41;

— the setter P4 V 36. Its left arm should be placed beyond the upper extension on the right of the control P4 GV 30;

— the right hand bent arm of the clearer P4 V 41;

— the left hand bent arm of the carriage brake P4 GV 74;

— collar 142 51 6 with its screw 120 30 14;

— the right hand bent arm of the carriage brake P4 GV 74;

— the left hand bent arm of the tabulator frame P4 EV 12;

— collar 142 51 6 with its screw 120 30 14;

— the right hand bent arm of the tabulator frame P4 EV 12.

N. B. The carriage brake P4 GV 74 should have its rear arm placed above the left arm of the tabulator frame P4 EV 12 (figure 40a).

b) Screw two conical pivot screws 129 40 4 on the fixed guide P4 GP 1 (figure 40) with respective nuts 138 40 5. Fix the left screw so that its head is flush with the corresponding nut.

c) Place shaft P4 V 15, ready assembled, between the two above mentioned pivot screws.

Check that the parts assembled on the shaft are in the positions shown in figure 40.

Reduce the axial play of the shaft P4 V 15 to 0,2 mm. (0.008 of an inch.) by adjusting the right hand conical pivot screw 129 40 4. Check that the shaft rotates with perfect freedom.

When this condition has been reached, lock nut 138 40 5 of right hand conical pivot screw 129 40 4.

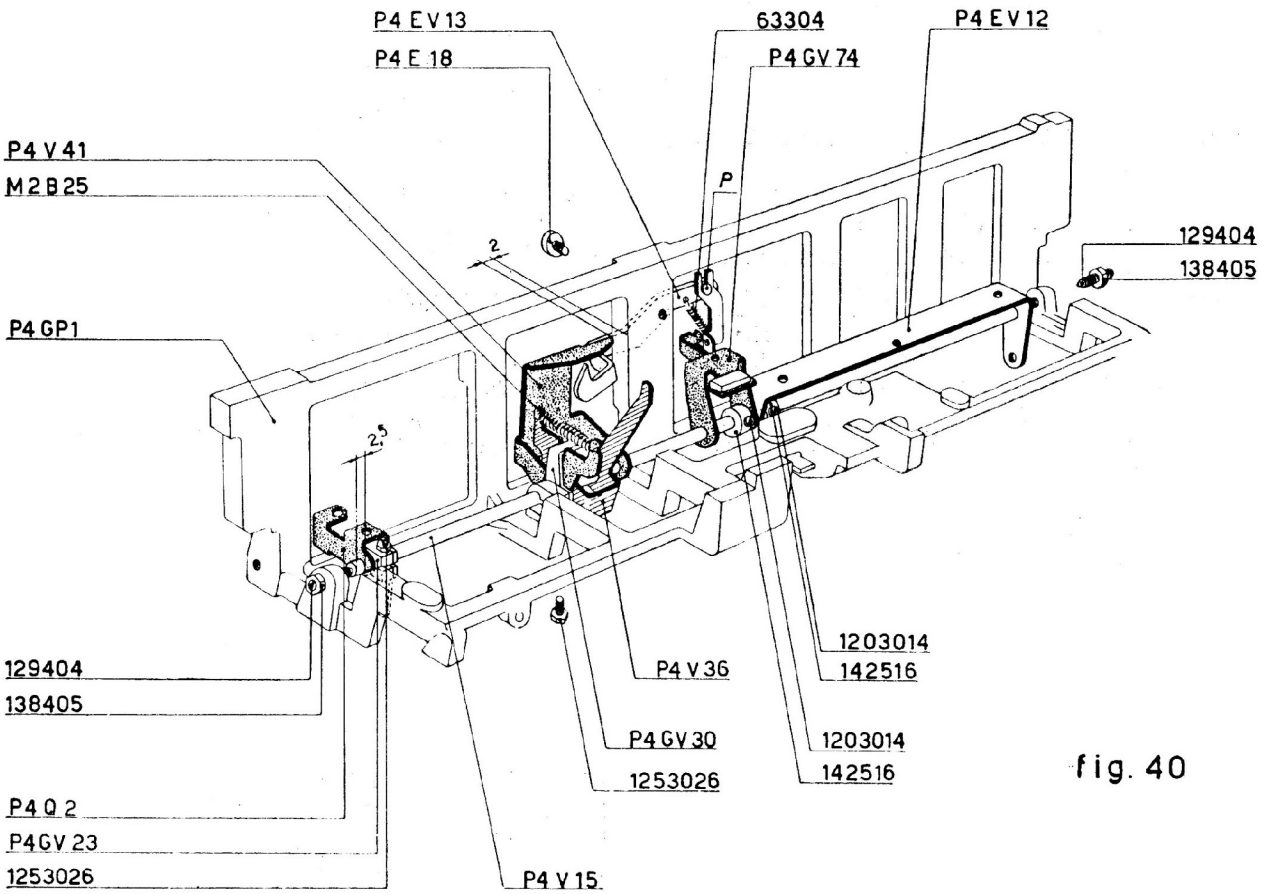


fig. 40

P4 E 18	Special stud for segment suspension rod	P4 GV 23	Setting and tabulator crank
P4 GP 1	Fixed carriage guide with rocker pivot	P4 GV 30	Clearer and setter control
P4 Q 2	Margin release bracket	P4 GV 74	Carriage brake
P4 V 15	Small tabulator control shaft	M2 B 25	Spring for setter and clearer
P4 V 36	Setter	120 30 14	Screw securing 142 51 6
P4 V 41	Clearer	125 30 26	Special screw for P4 GV 23 - P4 GV 30
P4 EV 12	Tabulator frame with bracket	129 40 4	Conical pivot screw for P4 V 15
P4 EV 13	Column finger	138 40 5	Hexagonal nut for 129 40 4
		142 51 6	Collar for P4 GV 74 - P4 EV 12
		63 30 4	Spring for P4 EV 13

d) Assemble the bracket carrying the stops and spring P4 V 73 on the fixed guide, securing it with two screws 120 30 3 (figure 41). The slot of the bracket should be centred in relation to the screws. Lock the latter.

The setter P4 V 36 and the clearer P4 V 41 rest respectively on the two arms of P4 V 73.

e) Hook spring M2 B 25 between clearer P4 V 41 and setter P4 V 36 (figure 40).

f) Temporarily adjust the axial position of the parts assembled on shaft P4 V 15 (figure 40):

— the margin release bracket P4 Q 2 should have 2,5 mm. (0.1 of an inch.) clearance from the left hand end of the shaft P4 V 15. To obtain this condition, move the crank of the setter and clearer P4 GV 23 as required. The lower leg of the latter should be more or less vertical. Screw in screw 125 30 26 without tightening;

— the left hand end of the upper portion of P4 V 41 should be 2 mm. (0.08 of an inch.) from the adjacent cross piece of the fixed guide. To obtain the required condition, move the setter and clearer control P4 GV 30. When adjusted, screw in screw 125 30 26 without tightening it.

g) Fit the slot of the tabulator frame connecting rod P4 EV 12 on the pin **P** of the tabulator finger P4 EV 13. Secure the latter to the fixed guide with a stud P4 E 18 (figures 40-41). Adjust the connecting rod mentioned so that it is vertical by moving the two collars 142 51 6 as required. Furthermore, the collars must be so placed that the frame P4 EV 12 and the brake P4 GV 74 have a slight axial play which allows them complete rotational freedom.

h) Hook springs:

— 63 30 4 between the rod of P4 EV 12 and P4 EV 13 (figure 40);

— M2 B 25 between P4 V 73 and P4 GV 74 (figure 41);

— 63 50 3 between P4 V 73 and the lower leg of frame P4 EV 12 (figure 41).

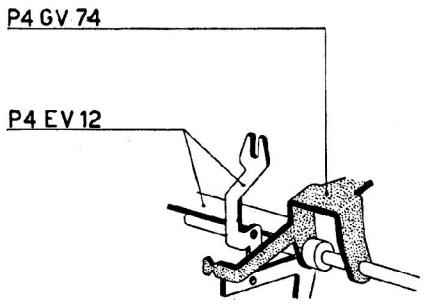


fig. 40a

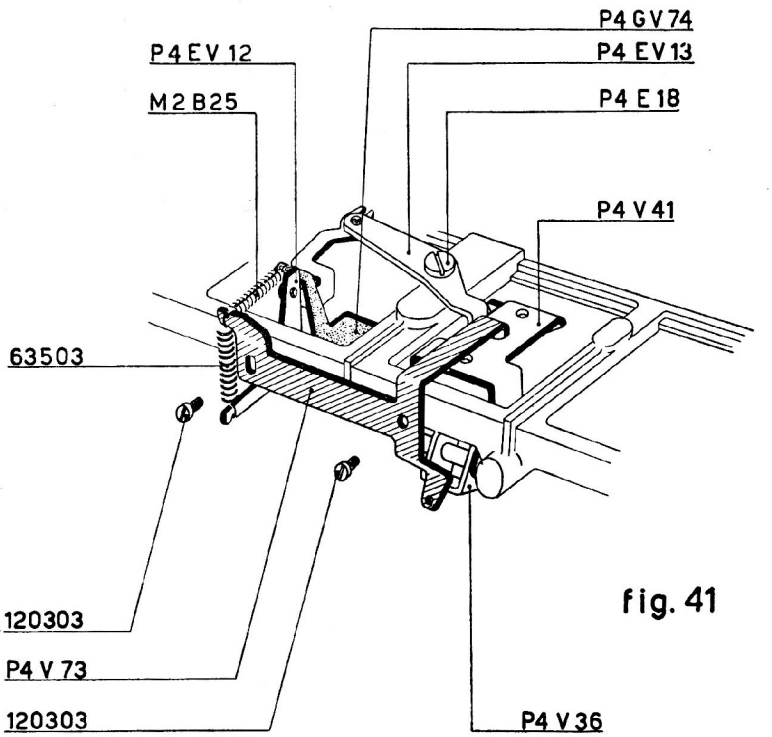


fig. 41

P4 E 18	Special stud for segment suspension rod	P4 EV 13	Tabulator finger
P4 V 36	Setter	P4 GV 74	Carriage brake
P4 V 41	Clearer	M2 B 25	Spring for P4 GV 74
P4 V 73	Stop and spring carrying bracket	120 30 3	Cheese head screw securing P4 V 73
P4 EV 12	Tabulator frame with bracket	63 50 3	Spring for P4 EV 12

40 - FIGURE 42

a) Assemble on the fixed guide:

— the two lower rollers M2 GP 10. Secure them with nuts 138 70 1 which should be thoroughly screwed home;

— the right hand lower roller M2 GP 9 with two nuts 138 70 1. As a temporary measure for axial position, make sure that only a single thread of the shank of M2 GP 9 juts out from the inside nut. Keep the eccentricity turned downwards. Screw up the nuts, but not tightly;

— the shanks of the upper lateral roller P4 P 6. Secure them with two nuts 138 50 6 which should be screwed on, but not tightly. Keep their eccentricity turned upwards. Place roller M2 P 17 on each of the two shanks, securing it with the spring clip 45 22 1;

— upper central ball bearing P4 EP 5. Secure it with nut 138 50 6.

Keep its eccentricity turned upwards.

b) Place the check carriage plate P4 P 12 in position on the front central part of the fixed guide. Secure it with a screw P4 P 13 which should only be partially screwed in. Place washer 40 36 14 between the head of the screw and the plate.

c) Place ball bearing M2 P 16 in position over the hole in the small plate P4 P 12. Next place washer P4 P 20 and secure the bearing with special screw 125 40 3 which should only be partially screwed in.

d) Fit screw 125 30 10, placing washer 40 36 14 under its head, on the front part of the fixed guide.

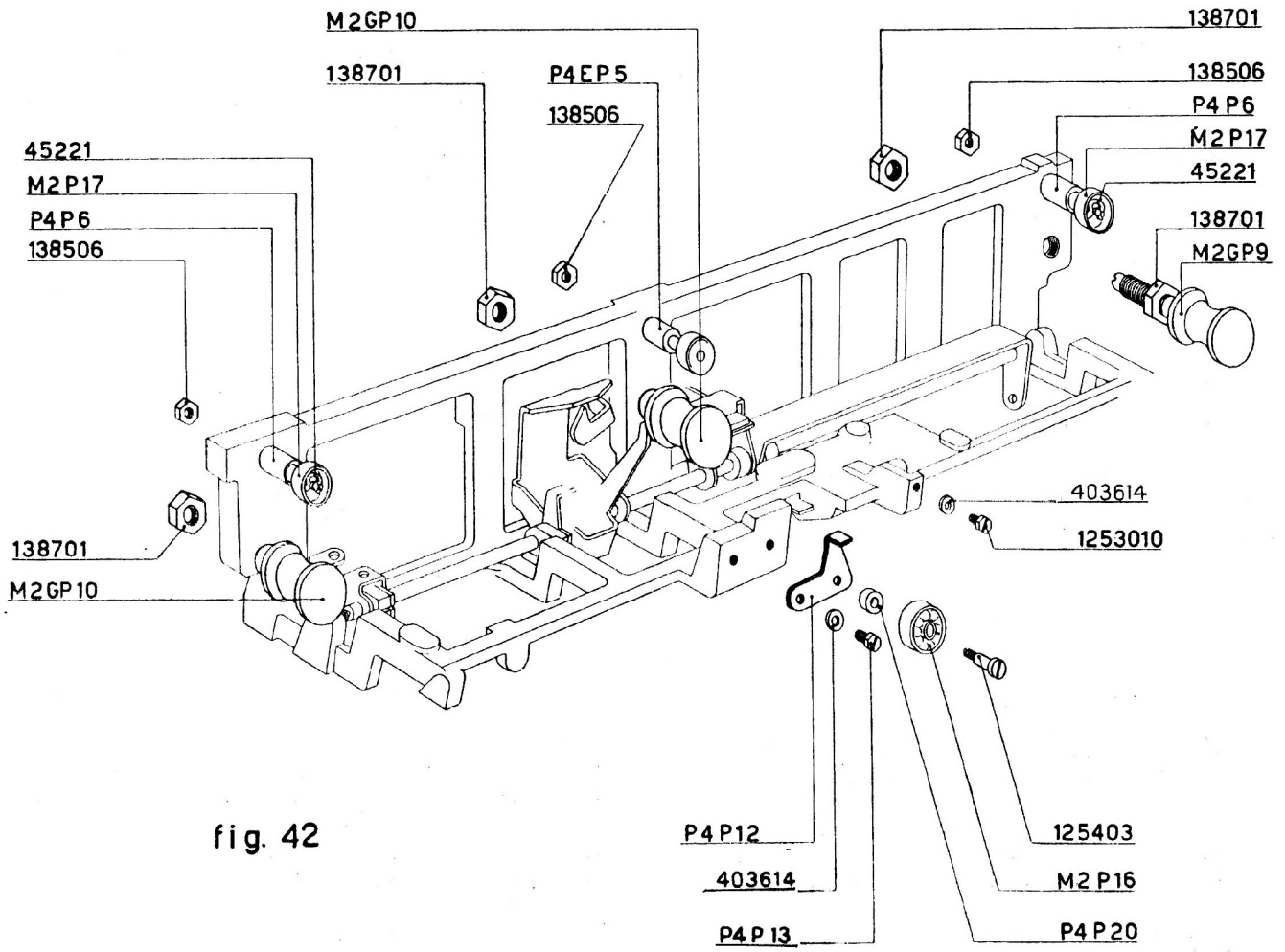


fig. 42

P4 P 6	Upper lateral shank	M2 GP 10	Lower left hand and central roller complete
P4 P 12	Check carriage plate		
P4 P 13	Special screw for P4 P 12	125 30 10	Special screw for P4 P 12
P4 P 20	Washer for upper bearing	125 40 3	Special screw for M2 P 16
P4 EP 5	Complete upper central roller	138 50 6	Hexagonal nut for P4 P 6 - P4 EP 5
M2 P 16	Ball bearing	138 70 1	Hexagonal nut for M2 GP 9 - M2 GP 10
M2 P 17	Upper lateral roller	40 36 14	Washer for 125 30 10
M2 GP 9	Lower right hand roller complete	45 22 1	Spring clip for M2 P 17

41 - FIGURE 43

a) Screw the fixed tooth position regulator P4 I 14 on to the fixed guide. Secure it with nut 138 30 5 which should be screwed on, but not tightly.

b) On the escapement rocker plate P4 EI 10:
— screwing the regulator P3 I 12 with its nut 138 30 5;
— fit movable tooth P4 I 11;
— hook spring P4 I 19 between the frame of the P4 EI 10 and the P4 I 11.

c) Assemble on the pin of the escapement wheel P4 I 3, the following parts in the order given:
— escapement wheel P4 GI 6;
— friction washer P3 I 18;
— silencer finger P3 I 7;
— spring for silencer finger P4 I 8;
— washer 40 36 6.

Screw the pin P4 I 3 on the fixed guide. Check that the smallest diameter spiral of the spring P3 I 8 fits round the washer 40 36 6.

The bent arm **A** of the silencer finger should fit in hole **F** of the fixed guide.

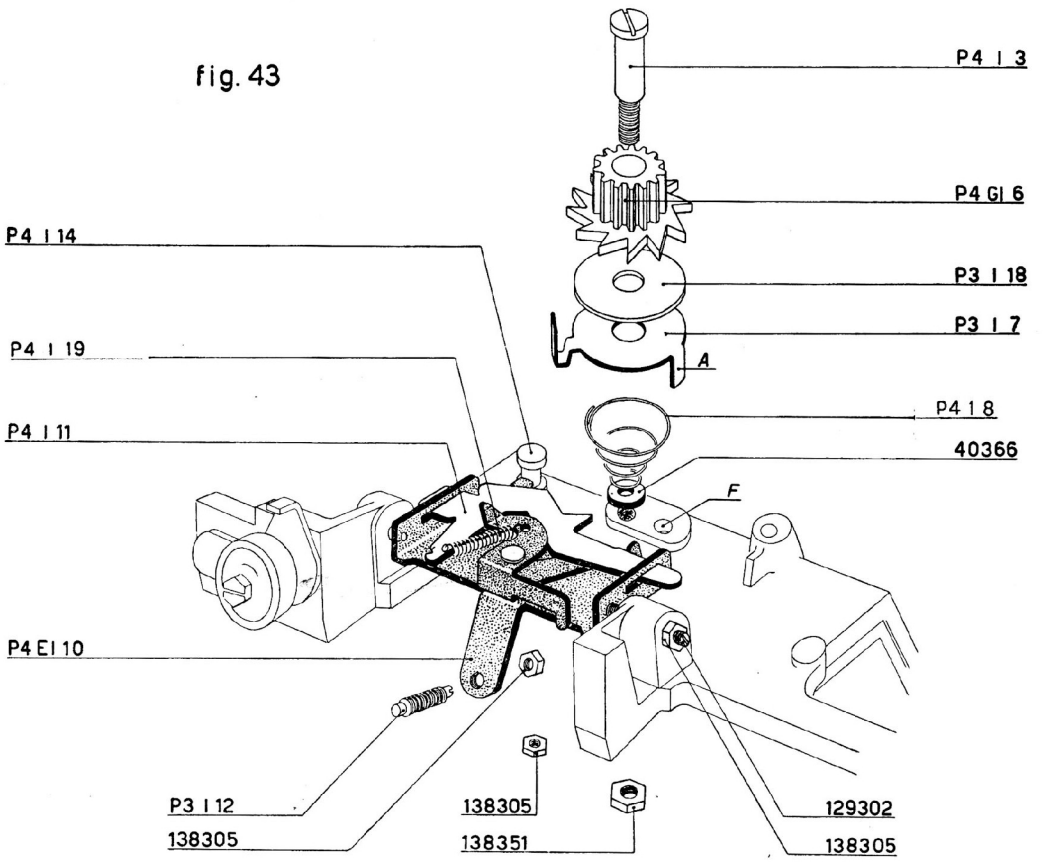
Lock pin P4 I 3; on its threaded shank screw on nut 138 35 1 which should also be well tightened. Check the perfectly free rotation of the escapement wheel; bear in mind that its movement is slightly checked by spring P4 I 8.

d) Screw conical pivot screw 129 30 2, with its nut 138 30 5, on to the fixed guide. Suspend the previously assembled escapement unit between this pivot screw and the one already fixed on the guide.

The rear spur of the fixed tooth P4 EI 10 should be inserted in the collar of the regulator P4 I 14.

Adjusting the conical pivot screw 129 30 2 as required. eliminate completely any axial play of the fixed tooth P4 EI 10. It must, however, rotate freely. When this condition is reached, lock the nut 138 30 5 of pivot screw 129 30 2.

fig. 43



P4 I 3	Escapement wheel pin	P3 I 12	Trip regulator V. T.
P4 I 8	Spring for silencer finger	P3 I 18	Friction washer for silencer finger
P4 I 11	Movable tooth of escapement	129 30 2	Conical pivot screw for P4 EI 10
P4 I 14	Fixed tooth position regulator	138 30 5	Hexagonal nut for 129 30 2 - P3 I 12 - P4 I 14
P4 I 19	Spring for P4 I 11		
* P4 GI 6	Escapement wheel and cogwheel	138 35 1	Hexagonal nut for P4 I 3
P4 EI 10	Escapement rocker plate with frame	40 36 6	Washer for P4 I 3
P3 I 7	Movable tooth silencer finger		

* Specify spacing.

42 - FIGURE 44

Hook spring P4 I 18 between the special bent extension of the fixed tooth and the slot in the special nipple on the fixed guide.

43 - FIGURE 45

For clarity, figure 45 only shows fixed tooth P4 EI 10.

a) Adjust the height of the regulator P4 I 14 so that there is a clearance of 0,2 mm. (0.008 of an inch.) between tooth **D** and the teeth of the escapement wheel.

N. B. The path of the fixed tooth is also determined by regulator P4 I 14.

44 - FIGURE 46

Again for clarity, figure 46 only shows the movable tooth.

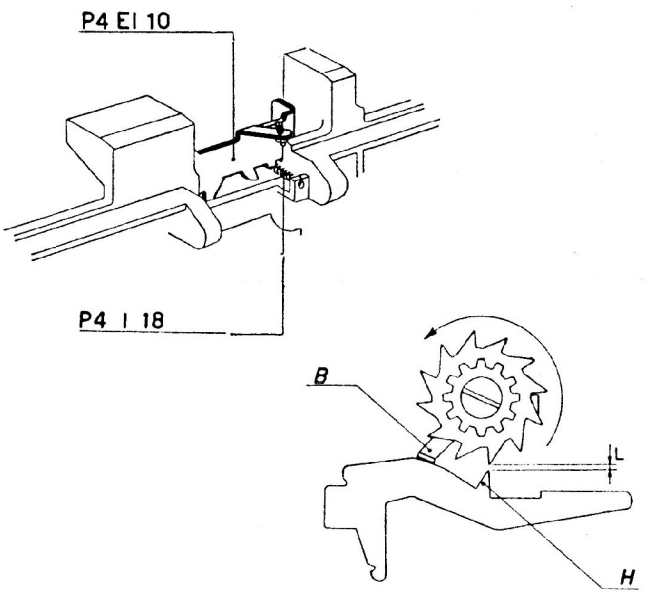
a) Rotate the escapement wheel anti-clockwise. The shank **B** of the silencer finger helped by the first tooth of the escapement wheel, should move the movable tooth away.

b) As rotation is continued, the successive teeth of the escapement wheel should pass the small tooth **H** of the movable tooth with a minimum safe clearance **L**.

N. B. The movable tooth should move away from the teeth of the escapement wheel smoothly. The bent portion of shank **B** should be more or less parallel to the inclined surface on which the movable tooth makes contact. If necessary, adjust the inclination, using moderate force.

c) If the escapement wheel is rotated clockwise, the movable tooth should return to rest, i. e. it should mesh with the teeth of the wheel itself.

fig.44



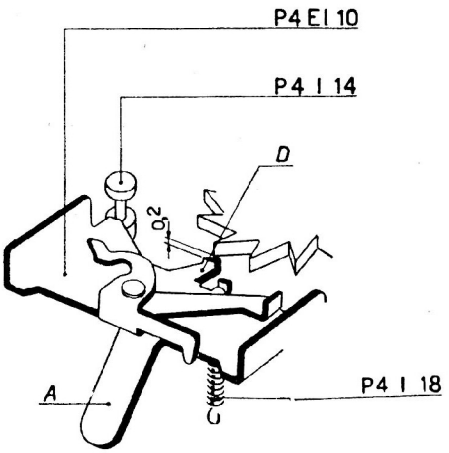


fig. 45

fig. 46

P4 I 14	Fixed tooth position regulator	P4 EI 10	Escapement rocker plate with frame
P4 I 18	Spring for P4 EI 10		

45 - FIGURE 47

a) Assemble the right hand bracket for the release shaft P4 Q 40 on the upper face of the fixed guide. Secure it with two screws 120 30 3.

Screw the M2 Q 35 head less support screw with its nut 138 40 5 on to the bracket. Leave nut untightened.

b) Mount the bell striker P4 Q 22 on bracket P4 Q 40. Secure it with stud 126 30 33 and nut 138 30 5. Hook spring 63 25 5 between P4 Q 40 and P4 Q 22.

c) Place the bell M2 Q 43 in position on the rear part of the fixed guide with a washer 40 36 6 between the former and the guide. Secure with a screw 120 35 2.

46 - FIGURE 48

a) Assemble the frame with the back space control pawl P4 EN 6 on the right of the fixed guide securing it with special stud P4 N 8. Secure the pawl of P4 EN 6 with a stud M2 N 9.

Hook spring 61 30 8 between the frame and the pawl. Check for complete freedom of movement.

b) Hook pull rod P4 B 24/1 to the tabulator frame P4 EV 12. The free eye of the former hooks on the disengaging lever of the movable tooth P4 V 14. Place the latter on the corresponding nipple of the fixed guide and secure it with a stud 126 30 33. The bent end lever P4 V 14 should be placed in front of movable tooth P4 I 11.

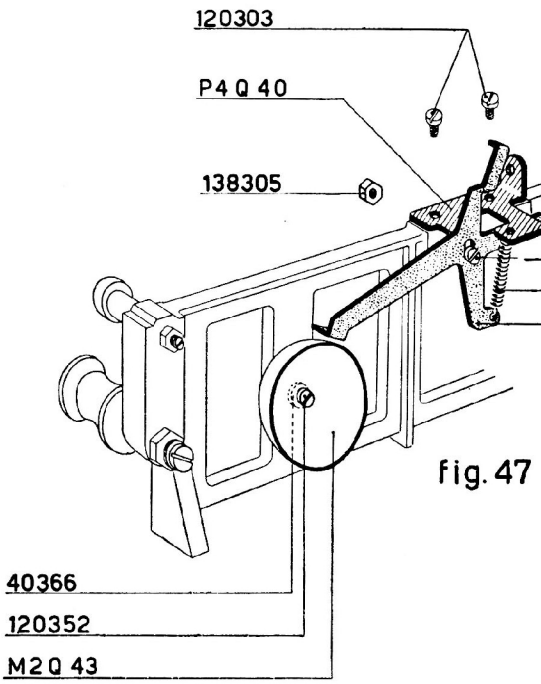


fig. 47

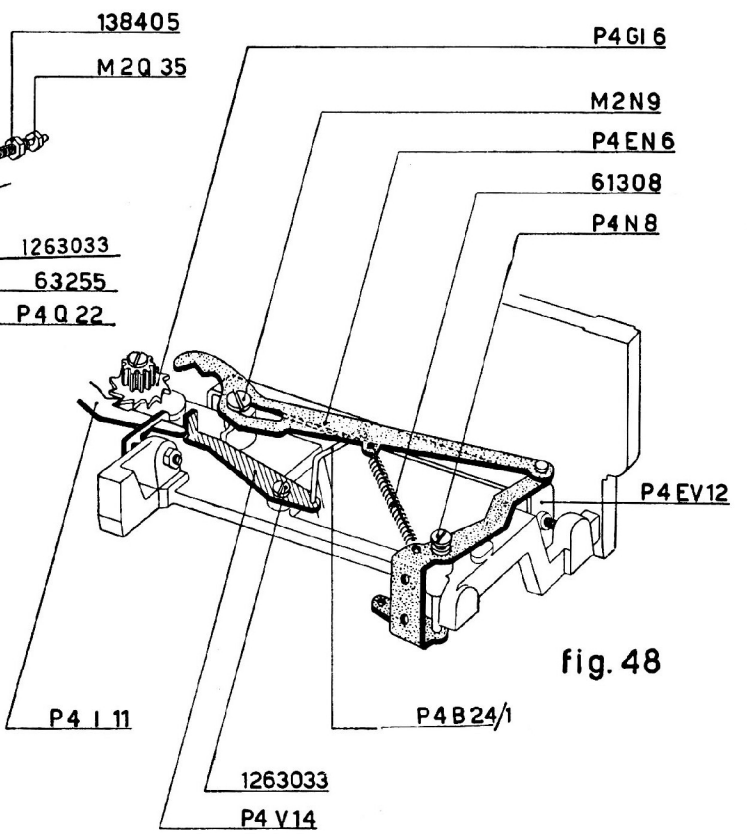


fig. 48

P4 B 24/1	First movement link	
P4 I 11	Movable tooth of escapement	
* P4 GI 6	Escapement wheel and cogwheel	
P4 N 8	Special stud	
P4 EN 6	Back space pawl with frame	
P4 Q 22	Bell striker	
P4 Q 40	Right hand release shaft bracket	
P4 V 14	Lever disengaging movable tooth	
P4 EV 12	Tabulator frame with bracket	
M2 N 9	Large headed collet screw for back space	

M2 Q 35	Headless support screw for release shaft
M2 Q 43	Bell
120 30 3	Cheese head screw for P4 Q 40
120 35 2	Cheese head screw for M2 Q 43
126 30 33	Cheese head pivot stud screw for P4 Q 22 - P4 V 14
138 30 5	Nut for 126 30 33
138 40 5	Hexagonal nut for M2 Q 35
40 36 6	Washer for M2 Q 43
61 30 8	Spring for P4 EN 6
63 25 5	Spring for P4 Q 22

* Specify spacing.

47 - FIGURE 49

a) Assemble the keyboard locking control lever and frame P4 EQ 8 under the fixed guide with a stud 126 30 33. The small shaft is inserted in the two guide holes made in the two special projections. Assemble the frame blocking eccentric P4 Q 12 on this small shaft with its screw 124 30 7. Temporarily adjust the axial position of the eccentric, so that its small shaft cannot slip out of the guide holes.

b) Place the vertical locking control lever P4 Q 9 on the rear part of the fixed guide, securing it with stud 126 30 33.

c) Hook springs 62 30 11 between P4 EQ 8 and P4 Q 9.

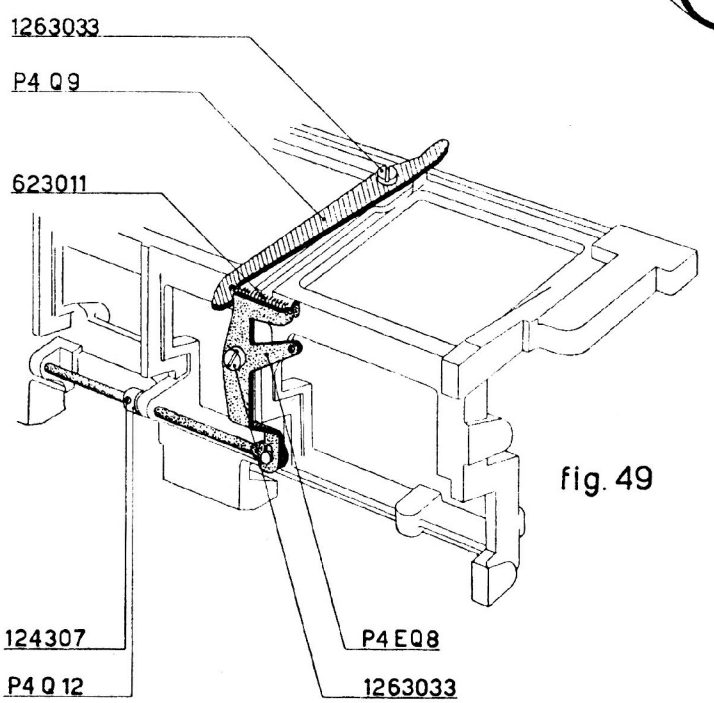


fig. 49

P4 O 1	Pin for main spring drum
P4 O 4	Carriage spring
P4 Q 9	Vertical keyboard locking control lever
P4 Q 12	Frame locking eccentric
P4 EQ 8	Keyboard locking lever with frame locking shaft

48 - FIGURE 50

Assembly of the main spring drum P4 CO 1.

a) Place spring P4 O 4 in the main spring drum P3 O 2. The external slot **H** of the spring fits over hook **G** on the wall of the drum.

b) Introduce pin P4 O 1. The bent tab **P** at internal end of spring P4 O 4 should fit inside the notch.

c) Arrange the cover P3 O 3 on the drum P3 O 2 so that its projecting tab **A** corresponds with slot **F** and the projection **K** are stopped by the dents **R**.

Bend tab **A** outwards and insert it in slot **F**.

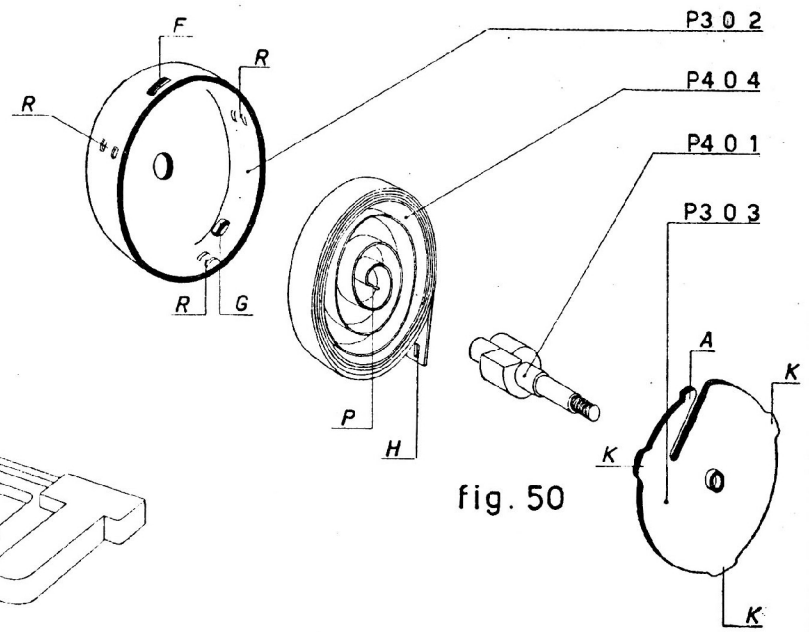


fig. 50

P3 O 2	Main spring drum
P3 O 3	Main spring drum cover
124 30 7	Grub screw for P4 Q 12
126 30 33	Cheese head pivot stud screw for P4 Q 9 - P4 EQ 8
62 30 11	Spring for P4 Q 9

49 - FIGURE 51

Fit the main spring drum P4 CO 1, ready assembled, on the left of the fixed guide. Secure it with nut 138 30 5 which should be thoroughly tightened.

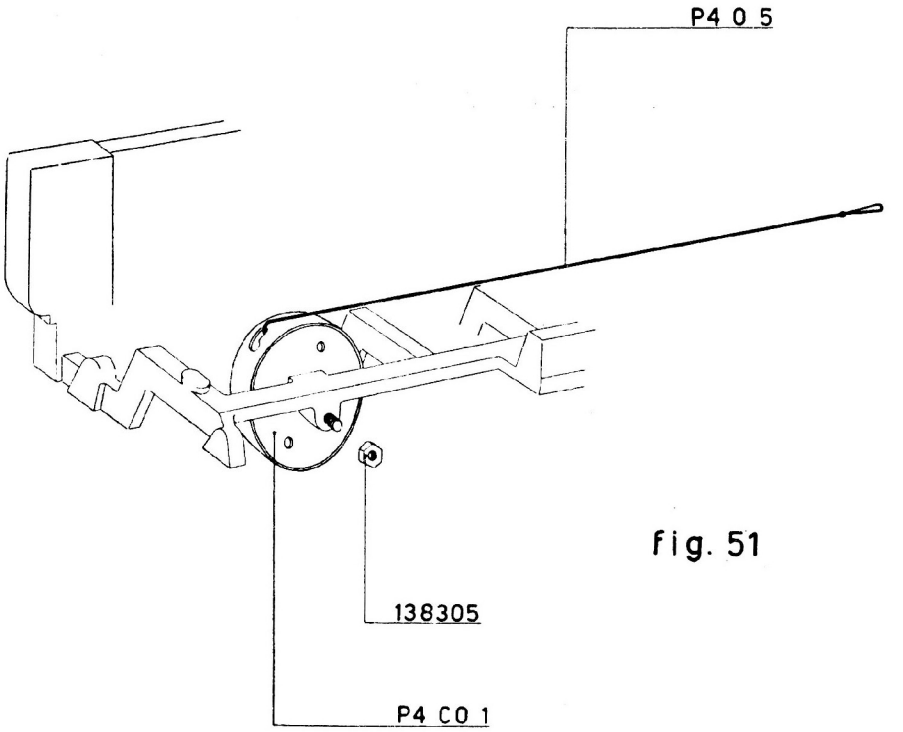


fig. 51

P4 O 5	Carriage draw wire	138 30 5	Hexagonal nut for P4 CO 1
P4 CO 1	Main spring drum complete		

50 - FIGURES 52 and 52a

a) Screw the support screw P4 R 15 with its nut 138 30 5 on to the right side of the movable guide P4 CR 1.

b) Assemble a pair of levers P4 R 7 on each small side of the movable guide, securing them with studs 126 30 42. Take care to place the lever of the front roller against the small side of the movable guide.

c) Place the shaft P4 GR 16 with lever controlling the lower paper feed, between the pivot **P** of the left side and the support P4 R 15 already screwed on the right side. The rear arm of the lever should rest on pin **P1**.

Adjust support P4 R 15 as required to reduce the axial play of shaft P4 GR 16 to a minimum compatible with perfect freedom of rotation. When this condition is obtained, lock the nut 138 30 5 of support P4 R 15.

d) Hook a spring P4 R 5 between each pair of levers P4 R 7 (figure 52a).

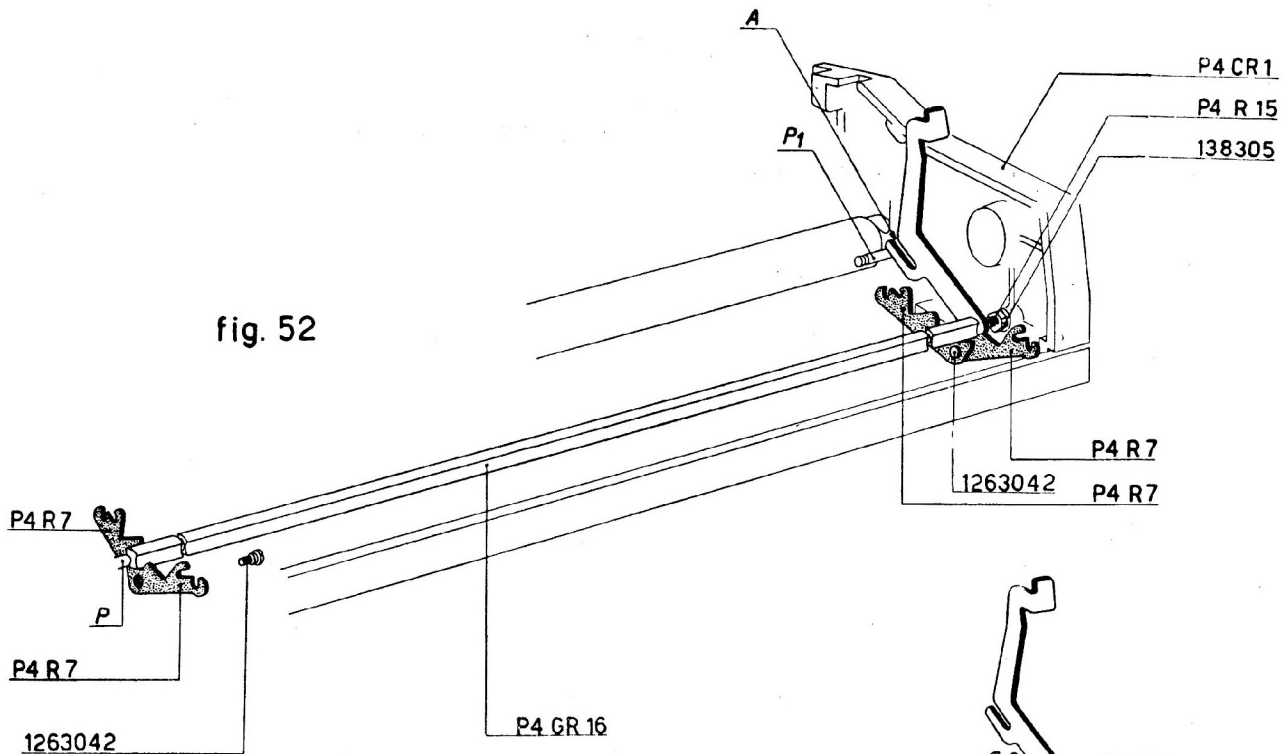


fig. 52

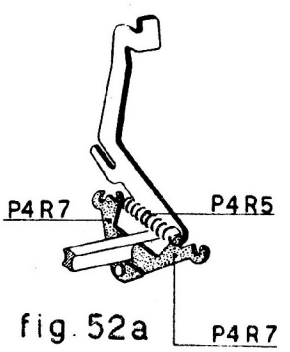


fig. 52a

P4 R 5	Spring for paper feed shaft	P4 CR 1	Side members of carriage with rail and tabulator tube
P4 R 7	Lower paper feed roller	P4 GR 16	Lower paper feed control
P4 R 15	Right hand support for lower paper feed control frame	138 30 5	Hexagonal nut for P4 R 15

51 - FIGURES 53 and 53a

a) Assemble a small spring M2 R 63 in each of the two bail rollers M2 DR 64. Place the rollers ready assembled on the bail rod P4 R 28. Mount the corresponding left and right hand arms P4 GR 30-S and P4 GR 30-D on the two extremities of the rod with special screw M2 R 66.

b) Assemble the left and right hand carriage release levers P4 S 3 and P4 S 4 on the guide pin **P** of the side of the movable guide. Slip over the same pin the rear slot of the two arms P4 GR 30-S and P4 GR 30-D.

c) Hook springs 63 50 3 between the spring holder of the arms P4 GR 30-S and P4 GR 30-D and the corresponding spring holder **P1** fixed on the side of the movable guide.

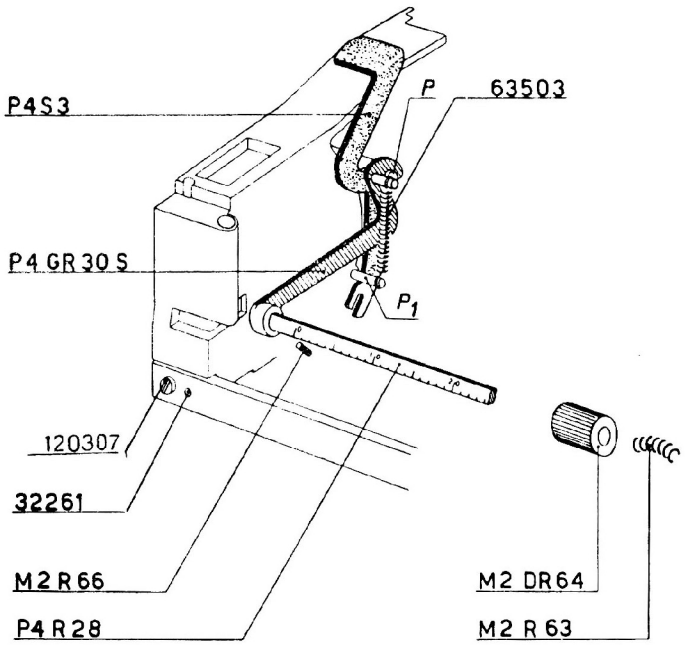


fig. 53

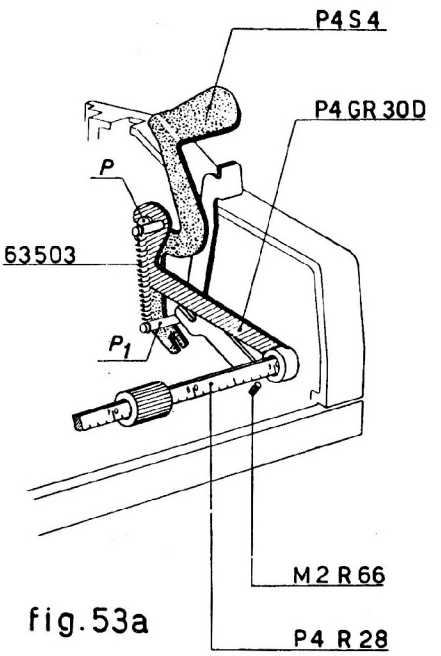


fig. 53a

* P4	R 28	Bail rod
P4	GR 30-D	Upper right hand bail rod arm
P4	GR 30-S	Upper left hand bail rod arm
P4	S 3	Left hand carriage release lever
P4	S 4	Right hand carriage release lever
M2	R 63	Spring for bail roller
M2	R 66	Bail bar screw
M2	DR 64	Bail roller
120	30 7	Cheese head screw for P4 R 1
32	26 1	Dowel pin for P4 R 1
63	50 3	Spring for P4 GR 30-S and D

* Specify spacing.

52 - FIGURES 54 and 55

a) Assemble leaf spring M2 R 33 on the paper guide P4 DR 31 (figure 54).

b) Place the paper guide ready assembled on the paper table P4 DR 24. Check that the former can slide, with slight friction, over the whole length of the plate. If necessary adjust the tension of leaf spring M2 R 33.

c) Hook the small springs 62 30 11 to the two rear holes on the paper table support.

d) Place the paper table support in position on the movable guide. Keep it pressed down and secure it with two screws 120 30 2.

e) Hook springs 62 30 11 to the two carriage release levers P4 S 3 and P4 S 4. Check that lever turns freely.

f) On the two sides of the movable giude screw respectively:

— the left hand carriage safety stop P4 T 23 with nut 138 35 1;

— the right hand carriage safety stop P4 T 24 with nut 138 35 1.

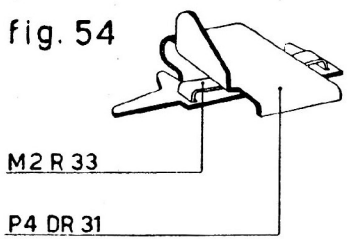


fig. 54

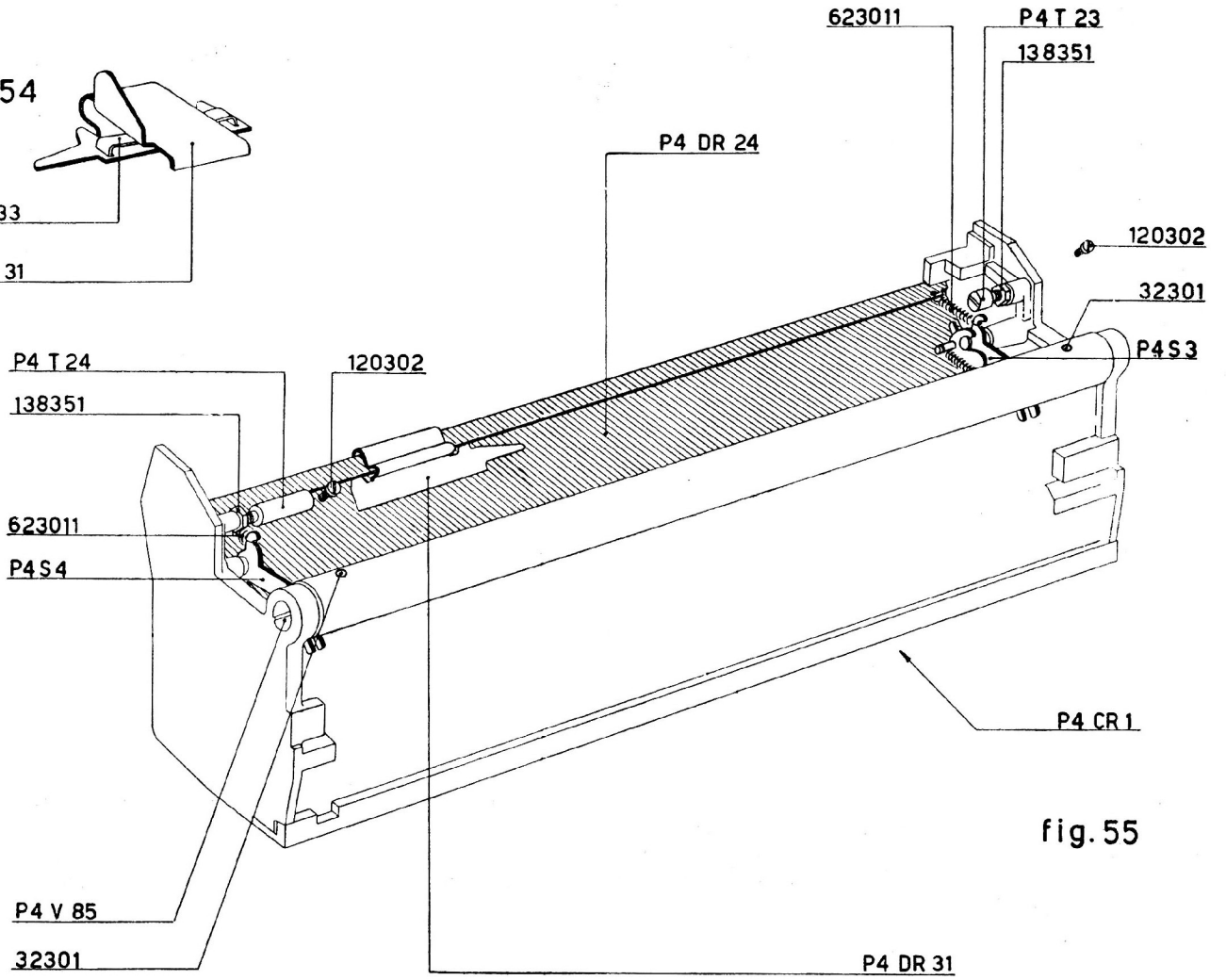


fig. 55

P4 CR 1	Carriage sides with rail and tabulator tube	P4 T 24	Right hand carriage safety stop
P4 DR 24	Paper table support	P4 V 85	Screw for tube
P4 DR 31	Paper guide with friction member	M2 R 33	Leaf spring for paper guide
P4 S 3	Left hand carriage release lever	120 30 2	Cheese head screw securing P4 DR 24
P4 S 4	Right hand carriage release lever	32 30 1	Dowel pin for P4 V 80
P4 T 23	Left hand carriage safety stop	138 35 1	Hexagonal nut for P4 T 23 - P4 T 24
		62 30 11	Spring for P4 S 3 - P4 S 4

53 - FIGURE 56

a) Assemble the carriage release bracket P4 GS 5 on the rack P4 I 5. Secure with two screws 120 30 14 which should be left slack.

b) Insert the pin of the bracket in the hole in the left arm of the carriage release control bracket P4 GS 8.

c) Insert the pin of a second carriage release bracket P4 GS 5 in the hole of the right hand arm of control bracket P4 GS 8. Secure the bracket to the rack with two screws 120 30 14 which should not be screwed in tightly.

d) The tolerance for the axial play of bracket P4 GS 8 is 0,5 to 0,6 mm. (0.02 of an inch.).

54 - FIGURE 57

a) Arrange the unit now assembled (rack and bracket) on the movable guide so that:

— the rack rests on the corresponding projections;

— the pin **P** of the lateral arms of the bracket enter into the end slots of the two carriage release levers P4 S 3 and P4 S 4.

Attach the rack with a screw 120 35 2 on the left and a special screw P4 I 13 on the right. The screws should be screwed home but not tightly.

b) Check that the bracket controlling the two levers P4 S 3 and P4 S 4 works freely. If necessary, adjust the level of the levers and the lateral arms of the bracket.

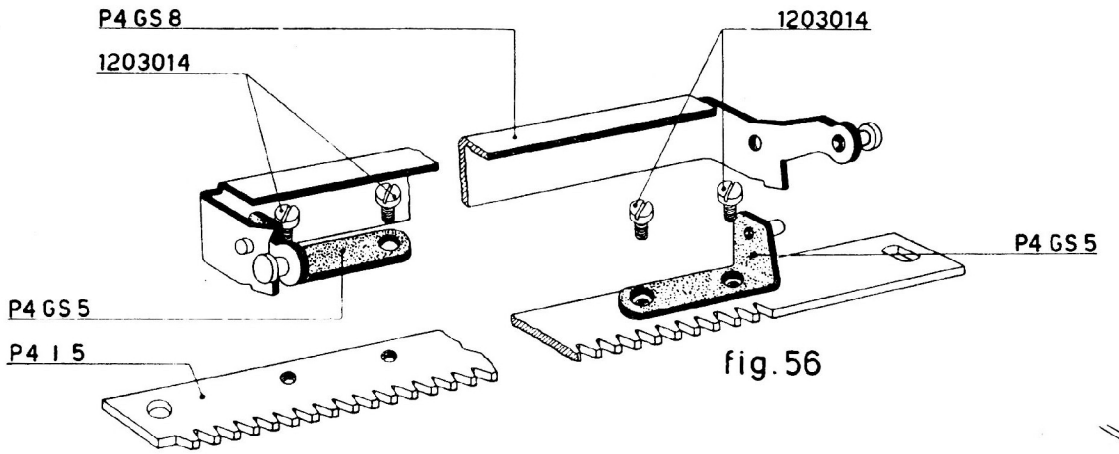


fig. 56

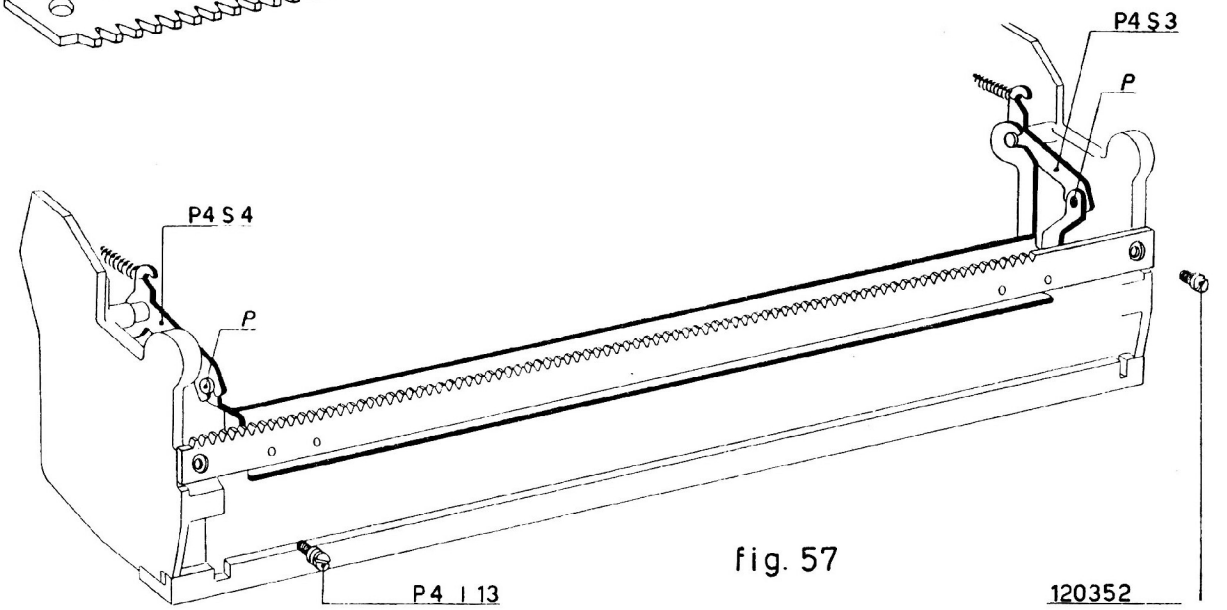


fig. 57

* P4 I	5	Rack	P4 GS	5	Bracket for carriage release control
P4 I	13	Special clamp screw for rack	P4 GS	8	Carriage release control
P4 S	3	Carriage release lever - left hand	120	30 14	Clamp screw for P4 GS 5
P4 S	4	Carriage release lever - right hand	120	35 2	Clamp screw for P4 I 5

* Specify spacing.

55 - FIGURES 58 - 59 - 60 - 60a and 61

The coupling of the movable guide to the fixed guide.

N. B. The tube on rail of the movable guide is guided by three grooved rollers below and by two rollers and a ball bearing above (figure 58).

— the left hand and centre grooved rollers **R** are fixed.

— the right hand grooved roller **Rr** is adjustable in height and side position.

— the upper rollers **R1** and the ball bearing **C** are adjustable in height.

a) Stop the movable tooth on the escapement wheel by inserting a 2 mm. (5/64") feeler in the right hand slot of the movable tooth guide.

b) Place the movable guide on the fixed guide. The rail tube should be lodged between the upper and lower rollers.

The front rail **R** (figure 61) must be inserted between the ball bearing M2 P 16 and the upper shank **A** of the carriage check plate P4 P 12.

c) Place the movable guide in the position indicated in figure 59. The rail tube **T** rests on the two fixed rollers **R**.

d) Adjust the height of the ball bearing **C** (figure 59). It should be brought in contact with tube **T**. Check that:

— when the bearing is rotated, it sets the movable guide in motion;

— using moderate pressure with one or two fingers on the bearing and making the movable guide slide, the bearing itself rotates.

e) Adjust the height of the upper left hand roller **R1** (figure 59). Lower it until it just barely touches the rail tube. When it is rotated, observe that it creates a certain amount of friction on the tube **T** without completely succeeding in setting the movable guide in motion.

f) Centre the movable guide in relation to the fixed guide. Adjust the right roller **Rr** for side position and height. It is then secured by two nuts **D** and **D1** (figure 60).

— to adjust the height, its threaded leg **V** must be turned.

— to adjust for side position, the leg **V** must be held steady while the nuts **D** and **D1** are screwed or unscrewed.

The roller **Rr** must be centred in relation to tube **T** (figure 60a) and must exert the same pressure on it as exerted by the grooved roller at the left.

g) Adjust the right hand upper roller in height. Proceed as explained in *d*) for the upper left hand roller.

h) Adjust the position of the carriage check plate P4 P 12 in height (figure 61).

Place a feeler of 0,1 mm. (0.004 of an inch.) thickness between the ball bearing and the lower face of the front guide rail **R**. Bring shank **A** of the carriage check plate P4 P 12 into contact with the upper side of the rail **R**. Lock the screws securing the bearing and plate.

i) Slide the movable guide and check that its movement is completely free and without noise. Check again, if necessary, the adjustments of the coupling.

l) Check that the nuts of the upper and lower rollers are thoroughly locked.

m) Release the movable tooth by removing the 2 mm. (5/64") feeler.

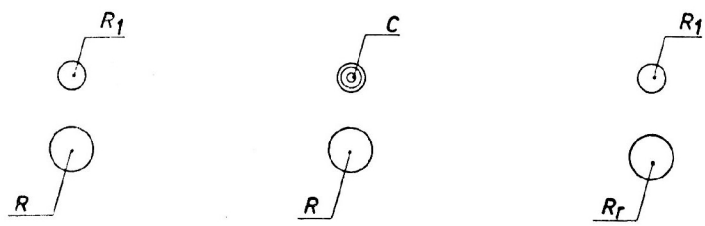


fig. 58

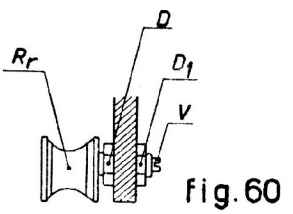


fig. 60

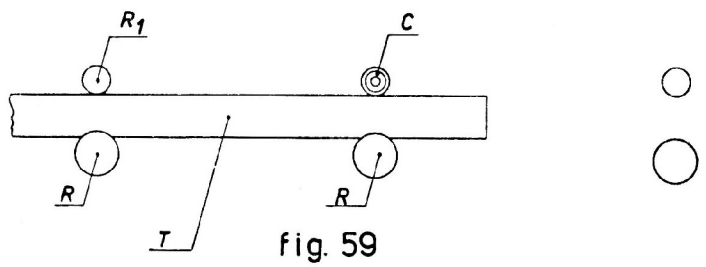


fig. 59

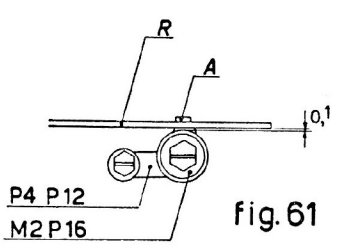


fig. 61

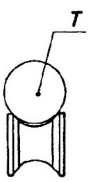


fig. 60a

P4 P 12 Carriage check plate

M2 P 16 Ball bearing

56 - FIGURE 62

Adjust the position of the rack in relation to the escapement wheel. The clearance indicated in the figure should be seen along the whole length of the rack.

This clearance is obtained by adjusting the depth of the rack. When this condition is reached, lock screw 120 35 2 and the special screw P4 I 13 which hold the rack to the movable guide (figure 57). Check that the movable guide slides freely; there should be no fouling between the rack and wheel.

57 - FIGURE 63

Adjust the position of the carriage release control in relation to the rack. Lowering one of the two carriage release levers P4 S 3 and P4 S 4, the control P4 GS 8 moves stank **A** of the carriage release frame backwards. The rear bent part **B** of the same frame carries movable tooth P4 I 11 forwards, thus disengaging it from the escapement wheel.

The path of the movable tooth must satisfy two conditions:

— it must be sufficient to cause the release of the carriage;

— it must not be excessive, e. g. such as to make the right hand portion of the movable tooth (shaded part) touch the projection **P** of the fixed guide. The movabel tooth should have a small safety clearance **L**.

These two conditions, which are obtained by moving the two brackets P4 GS 5 in relation to the rack, should be verified:

— with the carriage all the way over to the left: using the left hand carriage release lever P4 S 3;

— with the carriage all the way over to the right, using the right hand carriage release lever P4 S 4.

58 - Remove the movable guide from the fixed guide.

Wind the carriage main spring drum four or five turns. Hook the end of the carriage draw wire P4 O 5 in the opening in the rim of the spring drum (figure 51). The other end of the wire is hooked to stud P4 N 8 which holds the frame carrying the back space control pawl P4 EN 6 (figure 48).

Assemble the movable guide again on the fixed guide.

Unhook the end of the carriage draw wire from stud P4 N 8 and hook it to the special screw P4 I 13 which holds the rack to the movable guide on the right (figure 57).

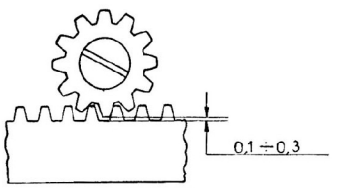


fig. 62

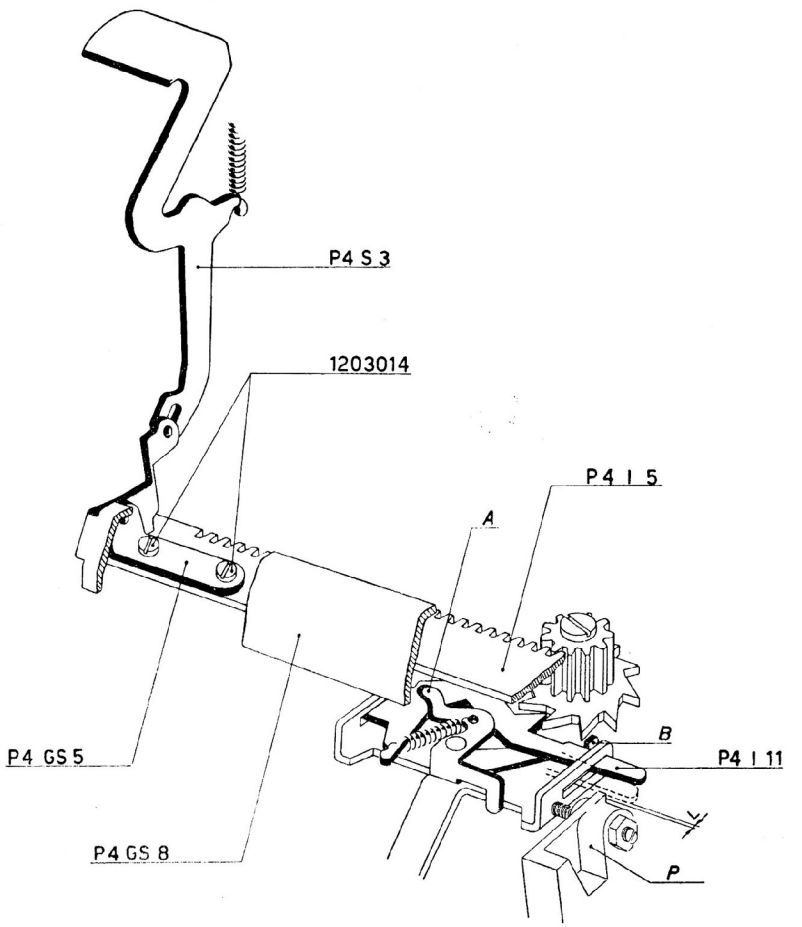


fig. 63

* P4 I 5	Rack	
P4 I 11	Movable tooth of escapement	
P4 S 3	Left hand carriage release lever	
P4 GS 5	Bracket for carriage release control	
P4 GS 8	Carriage release control	
120 30 14	Cheese head screw for P4 GS 5	

* Specify spacing.

61 - FIGURES 66 and 66a

a) Place the two margin setters, ready assembled, in position on the rack P4 T 1.

b) Assemble the graduated bracket with paper supports P4 CT 16 on the back of the movable guide. On it fit rack P4 T 1 with its margin setters.

Secure with two screws 120 35 4 which should partially screwed in and not tightened.

c) By adjusting the height of the bracket P4 CT 16 and the rack P4 T 1, regulate the margin setters so that they are at the same distance from the graduated bar (figure 66a).

When this condition is obtained, tighten screws 120 35 4.

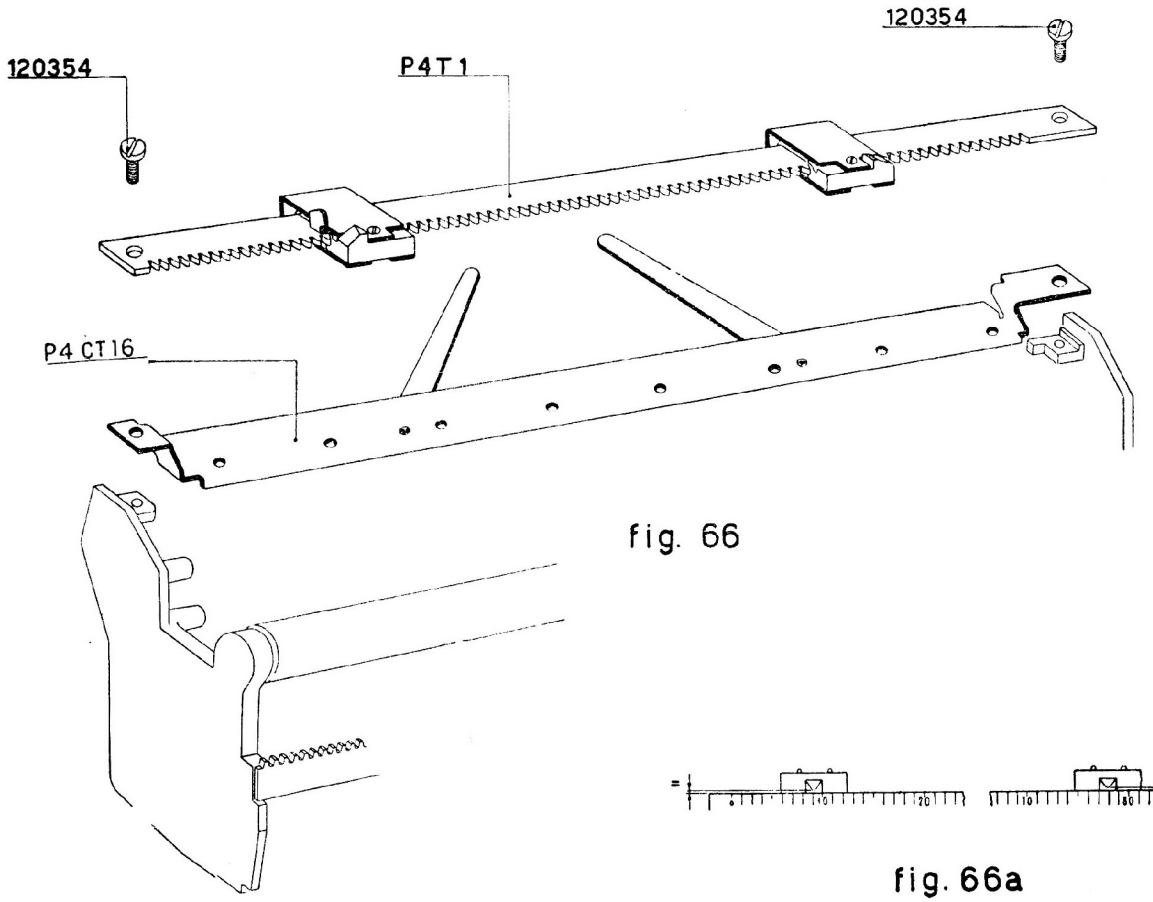


fig. 66

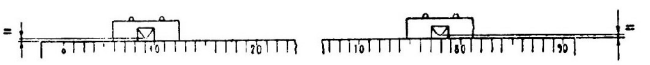


fig. 66a

* P4 T 1	Margin rack	120 35 4	Cheese head screw for P4 T 1
* P4 CT 16	Graduated bracket with paper supports		

* Specify spacing.

62 - FIGURES 67 - 68 - 69 and 70

a) In the left side of the movable guide (figure 67):
— screw the stop of pawl P4 U 41 with its nut 138 35 1 which should be partially screwed and not locked;
— fit the spring holder case M2 U 43 and place the spring for line spacer wheel position tooth P4 U 44 in position on it.

b) Place the rubber silencing element P4 U 59 in its seat on the upper face of the left side of the movable guide.

c) Arrange the line spacing cam P4 EU 49 on the collet of the left side. It's button should come out through the special opening above. Mount the graduated sector P4 U 53 securing it with screw P3 U 54. As a temporary setting, arrange it so that the slot of the sector is centered in relation to the screw. The latter should be only partially screwed in. Check that the upper spring of cam P4 EU 49 exerts its pressure so as to make the line space selector lever of P4 EU 49 enter into the corresponding positioning notch.

d) Insert the pin of line space lever bracket P4 GU 61 in its hole. Fit lower crank P4 HU 33 on the pin; position it as shown in figure 67 and secure it with a taper pin 33 16 1.

e) Hook the pull rod P4 U 34 to the crank P4 HU 33 in the direction shown in figure 67.

f) On the corresponding guide pin, fit roller fork P4 U 42 on which will also be set the roller P4 U 45 with its spring clip 45 18 1. Secure the fork with stud M2 U 54.

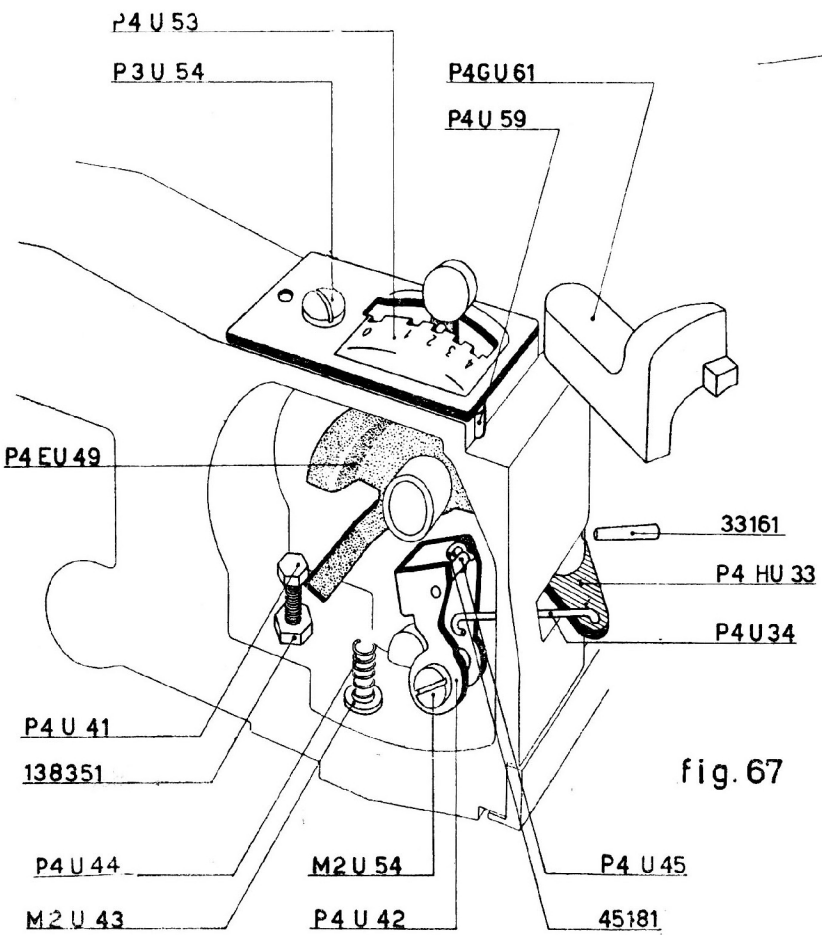


fig. 67

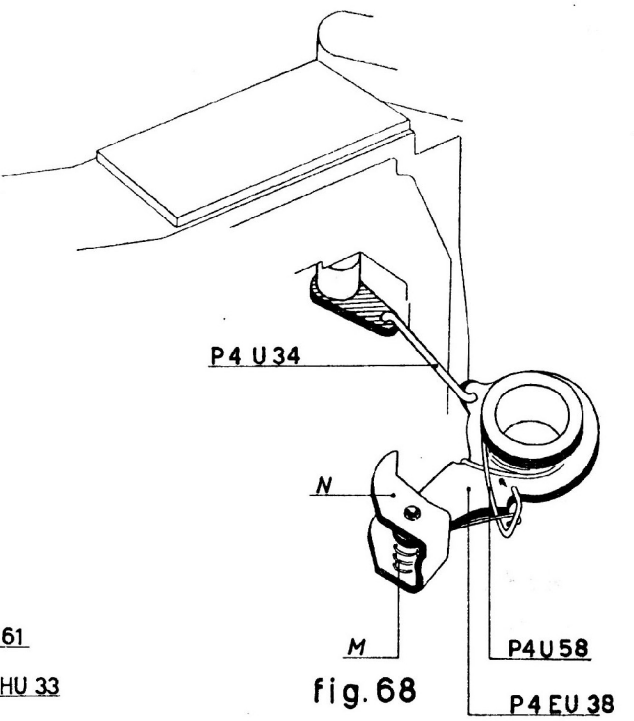


fig. 68

P4 U 34	Line space control pull rod	P4 EU 38	Spacer control crank with pawl
P4 U 41	Pawl stop	P4 EU 49	Spacer cam
** P4 U 42	Roller fork	P4 GU 61	Spacer lever bracket
P4 U 44	Spring for line spacer detent	P3 U 54	Line spacer sector clamp screw
P4 U 45	Detent roller	M2 U 43	Spring holder case
** P4 U 53	Graduated sector	M2 U 54	Cheese head screw for P4 U 42
P4 U 58	Roller crank return spring	33 16 1	Taper pin for P4 HU 33
P4 U 59	Silencing element for spacer lever	138 35 1	Hexagonal nut for P4 U 41
P4 HU 33	Lower spacer crank with hub	45 18 1	Spring clip for P4 U 45

** Specify line spacing.

Lower the roller so that it rests on spring P4 U 44.

Bring the line space selector lever to zero position (figure 69); its lower shank will hold down the fork of the detent roller.

g) Fit the return spring P4 U 58 on the pawl carrying crank P4 EU 38 (figure 68). Secure its long end to spring **M** of pawl **N**. This enables the crank P4 EU 38 to be assembled without the aid of special tools.

h) Hook the free eye of pull link P4 U 34 to crank P4 EU 38 (figure 68).

i) Place crank P4 EU 38 in position on the collet of the left side of the movable guide as shown in figure 69.

Using a tool for hooking springs place the end **D** of spring P4 U 58 in the same concavity where the crank P4 HU 33 is housed.

The end **C** of the same spring is placed in the special hole made in the same P4 EU 38.

The extremities **A** and **B** of the spring of pawl **N** are placed as shown in the same figure 69.

l) Place the line spacer lever P4 U 31 in position on the bracket P4 GU 61 with the spring washer P3 U 30 as shown in figure 70. Secure with stud P3 U 62.

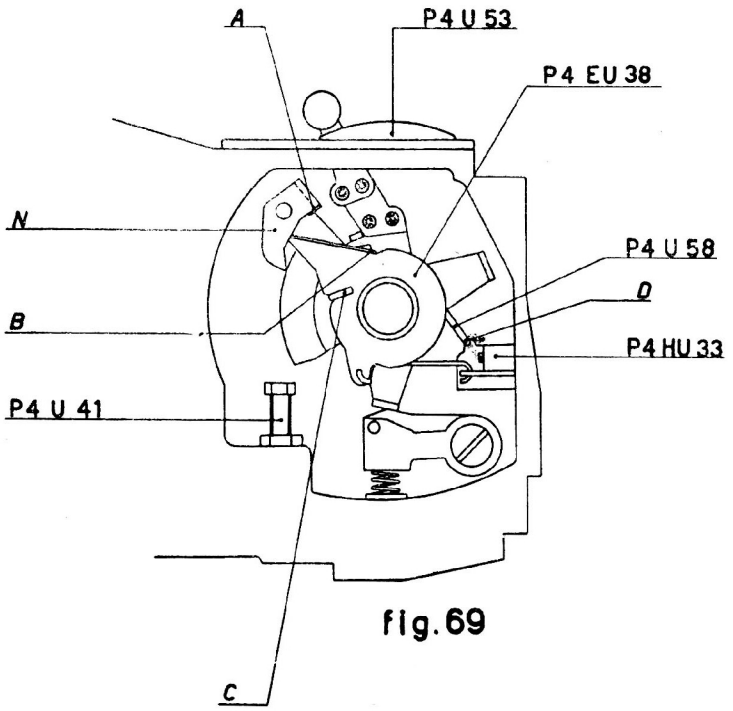


fig. 69

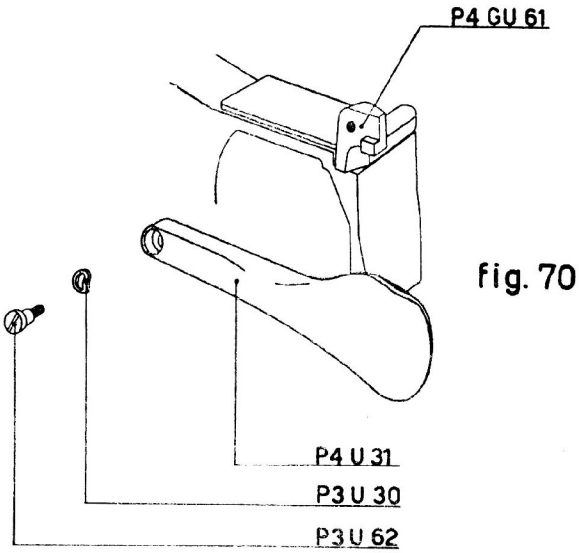


fig. 70

P4 U	31	Line spacing lever
P4 U	41	Pawl stop
** P4 U	53	Graduated sector
P4 U	58	Roller crank return spring
P4 HU	33	Lower line spacing crank with hub
P4 EU	38	Line spacer control crank with pawl
P4 GU	61	Line spacing lever bracket
P3 U	30	Spring washer for line spacing lever
P3 U	62	Line spacing lever stud

** Specify line spacing.

63 - FIGURES 71 and 71a

Assembling the clutch unit.

a) Fit the stop disc P4 U 18 on clutch shaft P4 U 5. The hole **A** of the disc should be centered in relation to the slot **F** of P4 U 5. Check that there is absolutely no play between the two parts now coupled.

b) Insert in this order in the opening of the clutch shaft P4 U 5:

— small spring P3 U 25;

— clutch control piston P4 U 24.

c) Secure the details now assembled with pin 32 17 1. This should be introduced successively:

— in the hole **A** of the stop disc P4 U 18;

— in the slot **F** of the clutch shaft P4 U 5;

— in the hole **B** of the clutch control piston P4 U 24.

Push the pin all the way in so that it does not project from any part of the stop disc P4 U 18.

d) Fit the line spacing wheel P4 U 16 on P4 DU 5. The small teeth of the stop disc should mesh with the inside toothed rim of the line spacing wheel.

e) Screw the platen knob P4 GU 8 in all the way.

f) Screw the clutch control button P4 GU 22 on the threaded pin of the piston. Lock it thoroughly with the special rubber pad UA 8044.

g) When the button P4 GU 22 is pushed inwards, the stop disc P4 U 18 should detach itself from the toothed rim of the line spacing P4 U 16.

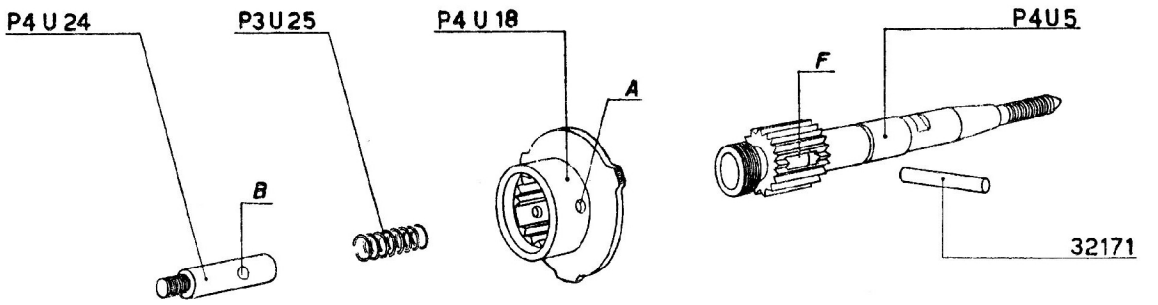


fig. 71

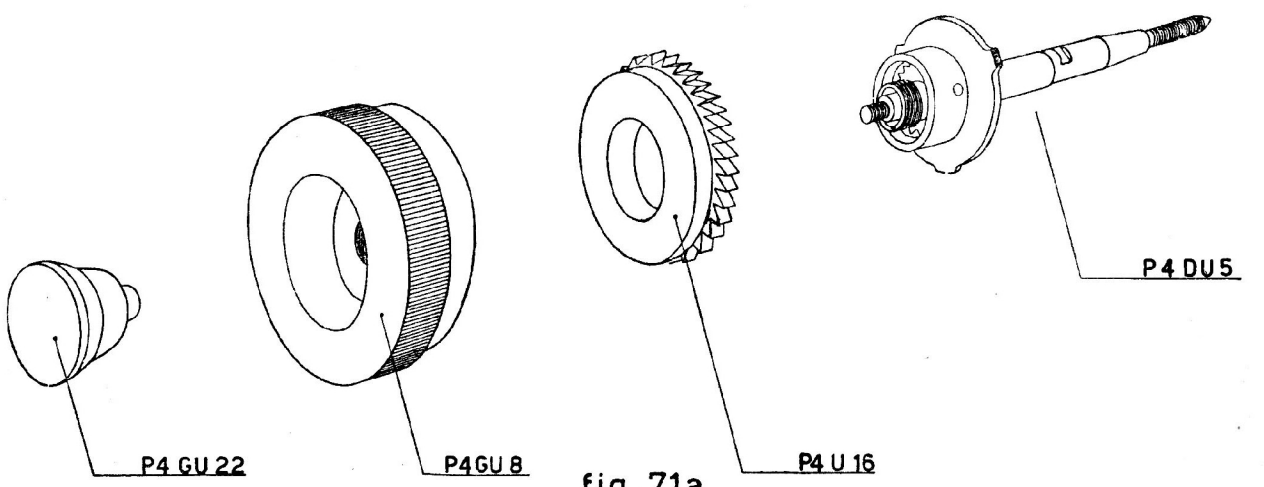


fig. 71a

P4 U 5	Clutch shaft	P4 GU 8	Left hand platen knob
** P4 U 16	Line spacing wheel	P4 GU 22	Clutch control button with bushing
P4 U 18	Stop disc	P3 U 25	Spring for clutch control piston
P4 U 24	Clutch control piston	32 17 1	Dowel pin for P4 U 24
P4 DU 5	Clutch shaft with stop dis.		

** Specify line spacing.

64 - FIGURE 72

a) On the lower feed levers P4 R 7 assemble:

— the front shaft with rubber feed rollers P4 GR 9;

— the rear shaft with rubber feed rollers P4 GR 10.

b) Fix leaf spring P4 R 37 on the front rail of the fixed guide with screw 120 30 14.

c) Place the paper pan P4 CR 23 in position. The notches of the two lateral shanks should fit into the special grooves in the shaft P4 GR 16.

Check that the paper pan oscillates flexibly on the leaf spring P4 R 37.

d) Screw two nuts 138 90 1 on the shaft of the right hand platen knob P4 GU 9.

e) Ease the platen P4 GU 1 on the pan plate. Screw in fiirmly at each end the left hand platen knob with clutch P4 GU 5 and the right hand knob P4 GU 9.

f) Manipulate the two nuts 138 90 1 so that when the platen completes a full rotation there is absolutely no axial play in at least one point during rotation.

In addition, check the complete freedom of rotation of the platen. During this operation move the upper and lower paper feeds away from it.

The platen, turning in either direction, should not drag on the paper pan P4 CR 23. If required, tighten its two coupling fins and modify by careful bending, the tension of the leaf spring P4 R 37.

g) Check the paper intake between the platen and the lower rollers. Place a paper feeler gauge 0,08 mm. (0.0031 of an inch.) thick between each of the latter and the platen. The feeler should be held firmly.

If the central rollers do not hold the paper, check that the shafts P4 GR 9 and P4 GR 10 are level. If necessary, decrease the tension of springs P4 R 5 which are between each pair of levers P4 R 7. If these springs are too strong, they may arch the two central rollers of the shaft outwards.

h) Check that the paper feed control lever P4 GR 16 makes an idle stroke of 4 ÷ 5 mm. (0.16 ÷ 0.2 of an inch.) before the rollers move away from the platen. The lever rests on pin **P1** of the right side of the movable guide (figure 52). Therefore:

— if the idle stroke is not as prescribed, close slot **A** of the control lever;

— if the idle stroke exceeds the prescribed limits, widen slot **A**.

i) With the lower paper feed open, check that twelve sheets of paper 0.05 mm (0.002 of an inch.) thick pass freely. If they do not, advance slightly the opening of the rollers, lessening the initial idle stroke of the control lever.

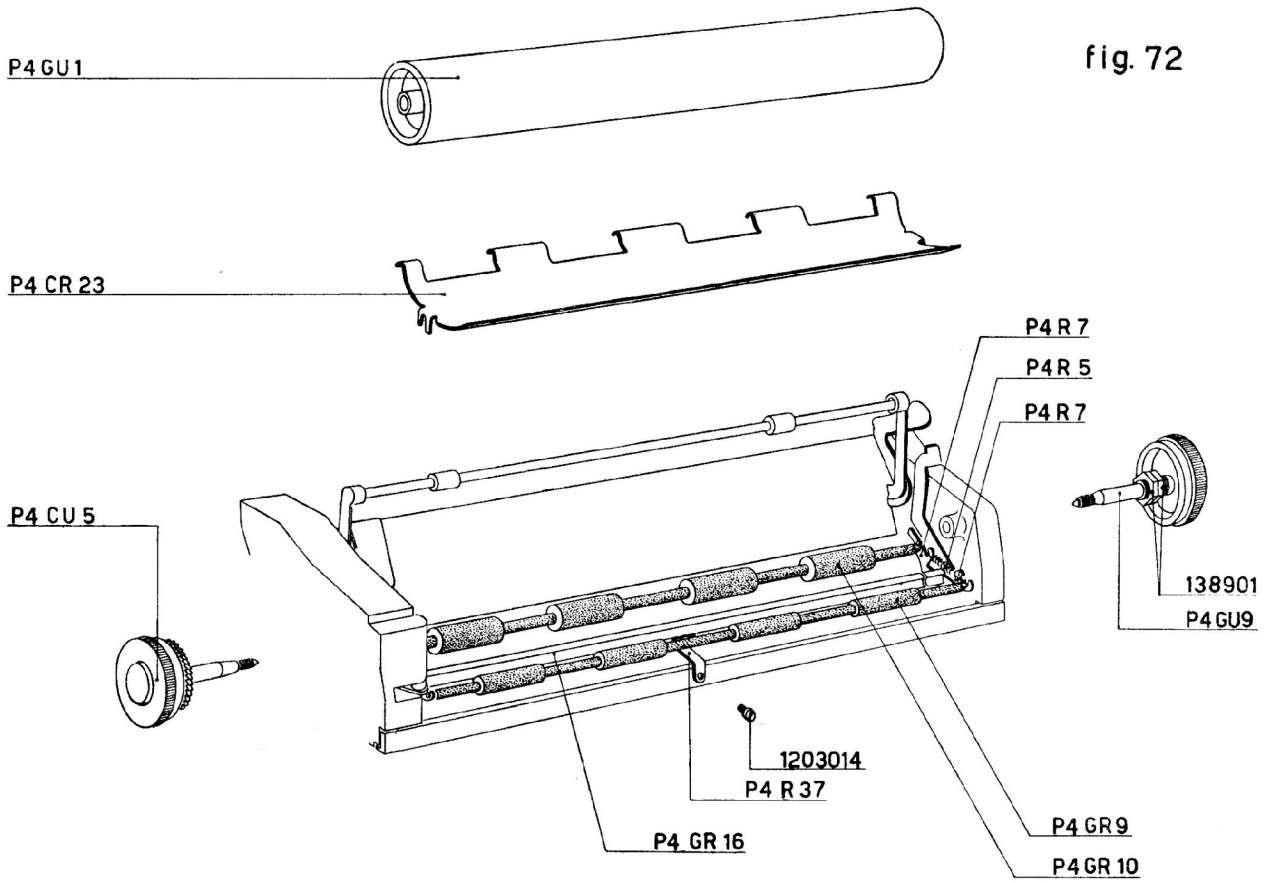


fig. 72

P4 R 5	Spring for papes feed shafts	P4 CR 23	Paper pan with cloth
P4 R 7	Lower paper feed levers	P4 GU 1	Platen with rubber
P4 R 37	Leaf spring for paper support plate	P4 GU 5	Left hand platen knob with clutch
P4 GR 9	Front paper feed roller complete	P4 GU 9	Right hand platen knob with shaft
P4 GR 10	Rear paper feed roller complete	120 30 14	Cheese head screw for P4 R 37
P4 GR 16	Lower paper feed control	138 90 1	Hexagonal nut for P4 GU 9

65 -

Adjustment of line spacing.

a) Bring the line space selector lever to position one. Move the line spacing control lever and make sure that the tooth of pawl **N** falls exactly on the middle line of the two teeth of the line spacing wheel. This condition is obtained by moving the graduated sector P4 U 53 as required (figure 59).

b) Bring the line space selector lever to position four. Move the line spacing control lever and check that the platen completes the expected five pitches. Leave the platen in this position, release the control lever and let it return to rest. The platen should remain stationary when the platen knob is manipulated. This check is necessary to ensure the platen has turned exactly five pitches.

The required condition is obtained by raising or lowering the pawl stop regulator P4 U 41.

66 - FIGURE 73

a) Assemble the protection plate P4 R 6 on the front of the movable guide. This is secured with the screws **A** and **B** (which hold the rail of the front guide on the movable guide) and with another two screws 120 30 7.

b) Loosen the two screws 125 30 10 and P4 P 13. Place the lower slot of the line guide indicator P4 P 11 between the fixed guide and washer 40 36 14.

Slide the movable guide and make sure that the line guide indicator brushes without absolutely touching the two sides of the movable guide itself. If necessary, adjust their position by careful bending.

67 - Remove the bar connecting the sides UA 8178/1 (figure 14).

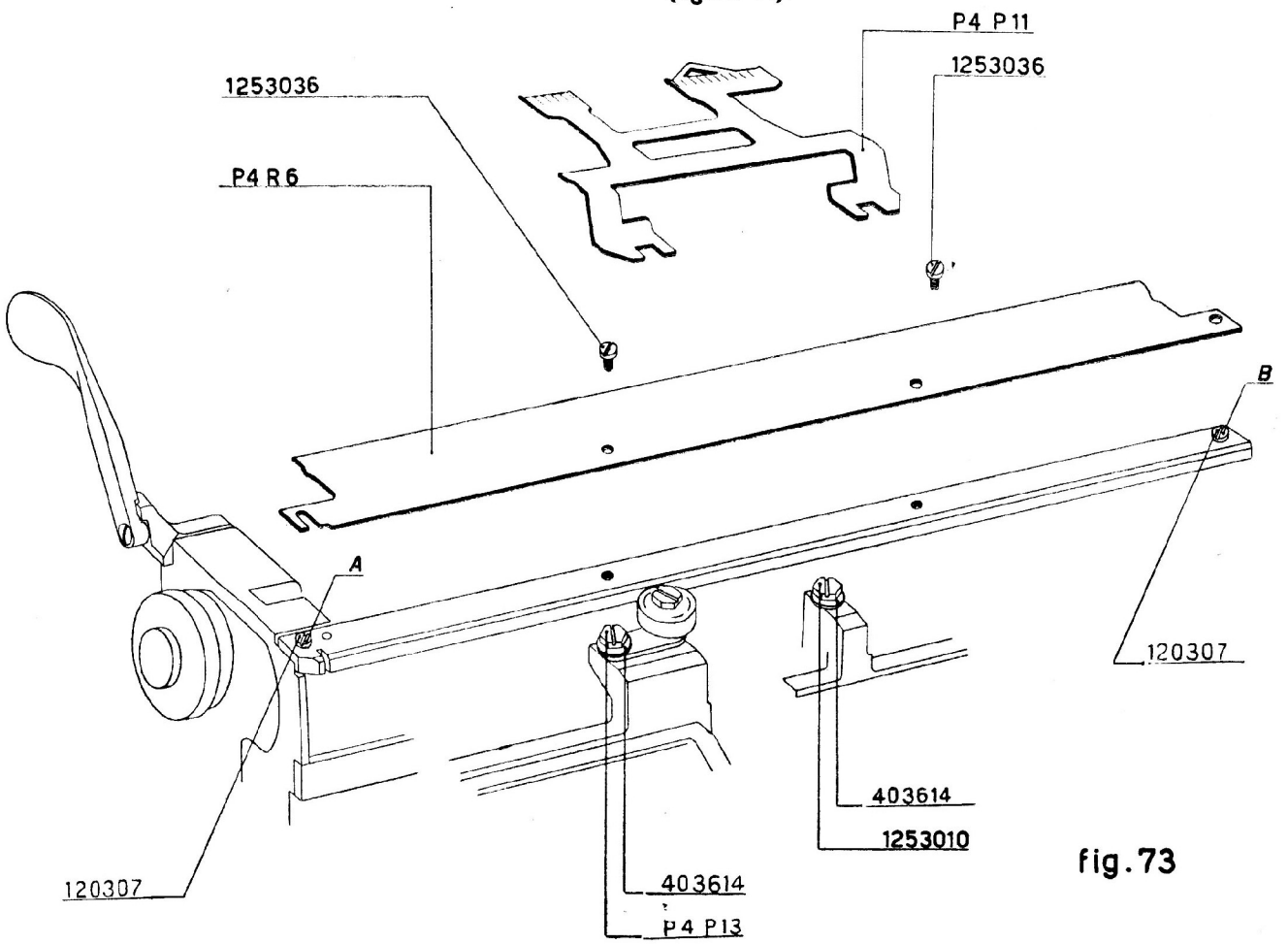


fig.73

* P4 P 11	Graduated indicator	120 30 7	Special screw for P4 R 6
P4 P 13	Special screw for P4 P 11	125 30 10	Special screw for P4 P 11
P4 R 6	Front protective plate	40 36 14	Washer for P4 P 11

* Specify spacing.

68 - FIGURE 74

Set the carriage on the machine. The four special projections on the fixed guide should rest on the four regulators P3 I 12 which have previously been screwed on to the sides of the machine (figures 12 and 13).

Secure the carriage with four screws 120 35 5 with washers 40 36 14 in between.

69 - With the carriage set on the machine, its sides are now in their permanent position.

a) Check again the axial play of the shaft with arms of the shift mechanism P4 G 9 (figure 19). There should be none. Obtain this condition by adjusting the two conical support screws 129 40 4 as required.

Make sure that the type bar segment has complete freedom of movement.

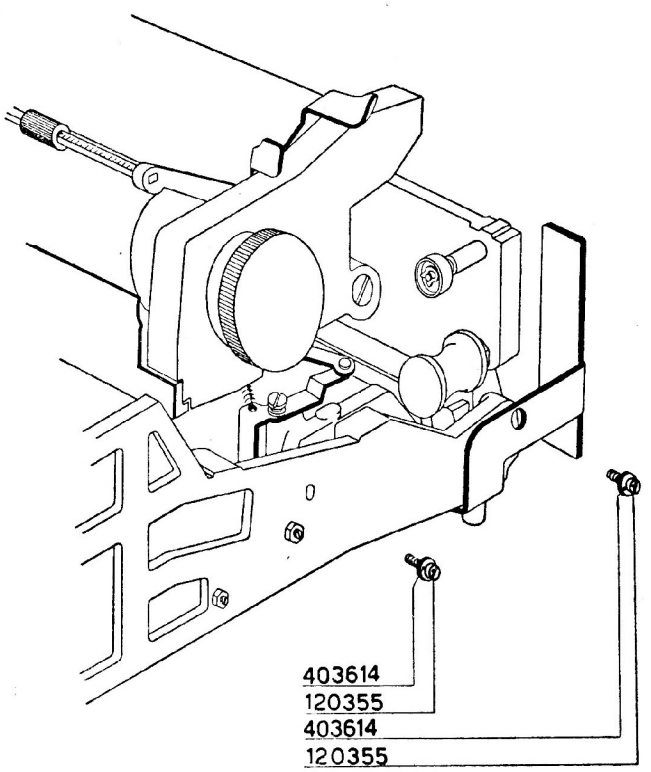
b) Check again the axial play of the ribbon carrier shaft P4 L 8 (figure 35). It should be a minimum and the shaft should rotate freely. This condition can be obtained by adjusting the two support screws 129 40 4 as required.

70 - Assemble the spools on the ribbon carrying the unit. Insert the ribbon in the ribbon carrier. Secure the spools with buttons P3 L 19.

71 - FIGURE 75

a) Hook link P4 V 2 to the setting and clearing crank P4 GV 23 in the direction shown in the figure.

fig. 74



P4 V 2	Setting and clearing control link
P4 GV 23	Setting and clearing crank
P4 EV 24	Setting and clearing control lever bracket

b) Hook the other eye of the link to the lever riveted on bracket P4 EV 24. Place the latter on the left side of the key lever bracket and secure it with two screws 120 30 3 which should only be partially screwed in.

72 - N. B. The fixed guide of the carriage rests on four special regulators screwed on the sides of the machine. The carriage has therefore, assumed a particular position.

Three distinct adjustments must be made; these are:

— the impact or striking of the type bars, on the segment and on the platen;

— the release of the type bars;

— line of writing on capitals.

These adjustments are indirectly connected with each other, and it is quite easy when obtaining one set of required conditions, to exceed the tolerance prescribed for another. For example, to obtain uniformity of the impact on the segment and on the platen, the depth of the carriage must be adjusted; to obtain the level for capital letters, the carriage must be raised. The second adjustment may upset the first. It is, therefore, necessary to make the final adjustments by degrees after having first made adjustments of a temporary nature.

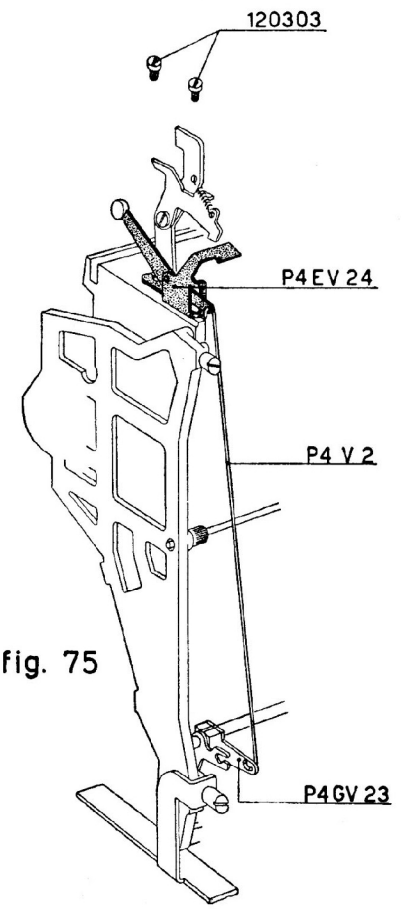


fig. 75

120 30 3	Cheese head screw for P4 EV 24
120 35 5	Cheese head screw securing carriage
40 36 14	Washer for 120 35 5

73 - FIGURES 76 - 77 and 78

Temporary adjustment of the points of impact.

a) In figure 76, the platen and the fixed guide are shown diagramatically. The latter rests on the front regulators **A** and on the rear ones **P**.

b) The point of impact of the type bars against the platen and against the segment should be adjusted as follows:

	on platen	on segment
1 sheet of paper on platen (thickness: 0,08 mm.— 0,0031 of an inch.)	yes	yes
ribbon	yes	yes
paper feeler (thickness 0,08 mm.— 0,0031 of an inch.)	yes	yes

To test the impact on the platen (figure 77), press the type bar gently at the point of contact with the stop tenon on the segment.

To test the impact on the segment (figure 78) press the type bar gently at the point of contact with the platen.

c) The paper feeler should be held equally at the segment and at the platen. If there is no impact on the platen, the platen itself must be brought forward. The rear regulators **P** must be screwed in further.

If there is no impact on the segment, the platen must be moved backwards. The regulators **P** must be unscrewed. The latter must always be screwed or unscrewed the same amount; this is absolutely necessary to ensure that they all remain in contact with the support projections on the fixed guide.

d) The impact should be tried out on the capitals and on the small letters; where there is a difference between the two positions of the type bar segment, the adjustment should be made preferably in the capitals position.

e) To move the platen, the four screws which secure the carriage to the sides, of the machine must be loosened. Gradually, and as the movement of the carriage is carried out and the checks effected, the screws should be screwed in thoroughly.

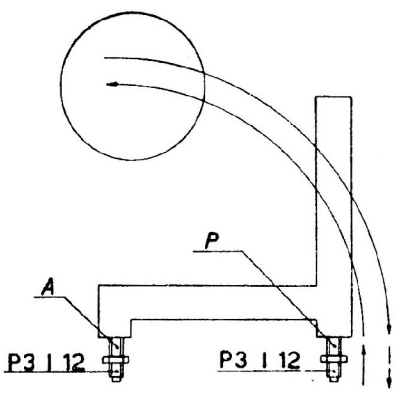


fig. 76

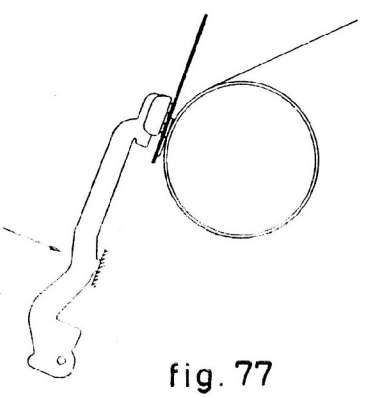


fig. 77

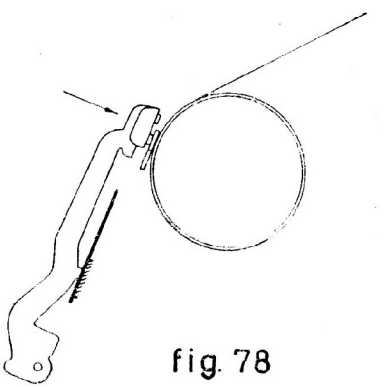


fig. 78

P3 I 12 Trip regulator

74 - FIGURE 79

Temporary adjustment of the trips.

The first trip of the escapement should occur when the type bar is 2 ÷ 7 mm. (0.08 ÷ 0.29 of an inch.) from the platen.

This condition is reached by adjusting as required the regulator P3 I 12 screwed on to the fixed tooth P4 EI 10.

75 - Set the two-colour change lever to blue. Adjust the angle of the second ribbon lift crank P4 GL 49 (figure 38) in relation to its shaft so that the ribbon can print. This adjustment, if such it can be called, has the sole object of rendering possible the operation which follows. The final adjustment of the two-colour device will be made after.

76 - FIGURE 80

Level of Capital Letters.

a) Strike all the capital letters and the numbers gently. The printing on the paper should be uniform, i. e. equally marked at the top and the bottom.

b) If the printing is lighter at the bottom, the platen is too high, the front regulators **A** must be lowered.

If the printing is lighter at the top, the platen must be raised, screwing in further the same regulators **A**.

77 - Make the final adjustments of the type bar impacts on the platen and segment according to instructions in paragraph 73.

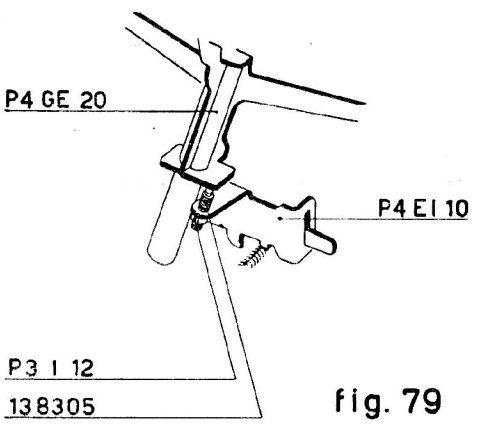


fig. 79

78 - Make the final adjustments of the trips according to instructions in paragraph 74.

79 - Adjustment of the small letters - capitals level.

Strike successively a series of letters on the small letters and the capitals HhHh, XxXx, MmMm, WwWw.

The letters should be perfectly aligned.

N. B. The position of the movable type bar segment is determined with a special tool. Its path is fixed with the special feeler 6,6 mm. (0.25984 of an inch.) thick.

If the alignment between the capitals and the small letters is not as desired, only the level of the capitals should be slightly retouched and that of the small letters left unchanged. This retouching is negligable and does not compromise the adjustment of the impact, the trips and the capital letter level.

Therefore:

— if the capital letters are lower than the small letters, the path of the movable type bar segment must be reduced: screw in, to an equal extent, the two lower stop regulators P4 G 11 (figure 21);

— if the capital letters are higher than the small letters the path of the movable type bar segment must be increased. Unscrew to an equal extent the two regulators mentioned, P4 G 11.

80 - Carry out the alignment of the type in the usual way.

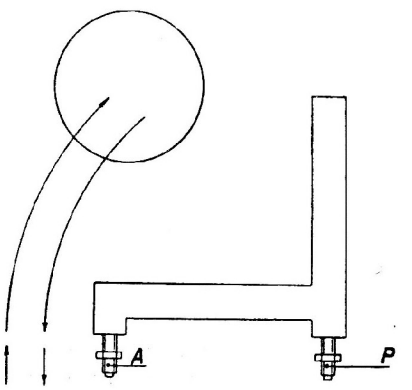


fig. 80

P4 GE 20	Universal frame complete
P4 EI 10	Rocker plate of escapement, with frame
P3 I 12	Trip regulator
138 30 5	Hexagonal nut for P3 I 12

81 - FIGURES 81 - 82 - 83 - 83a and 84.

Adjustment of two-colour device.

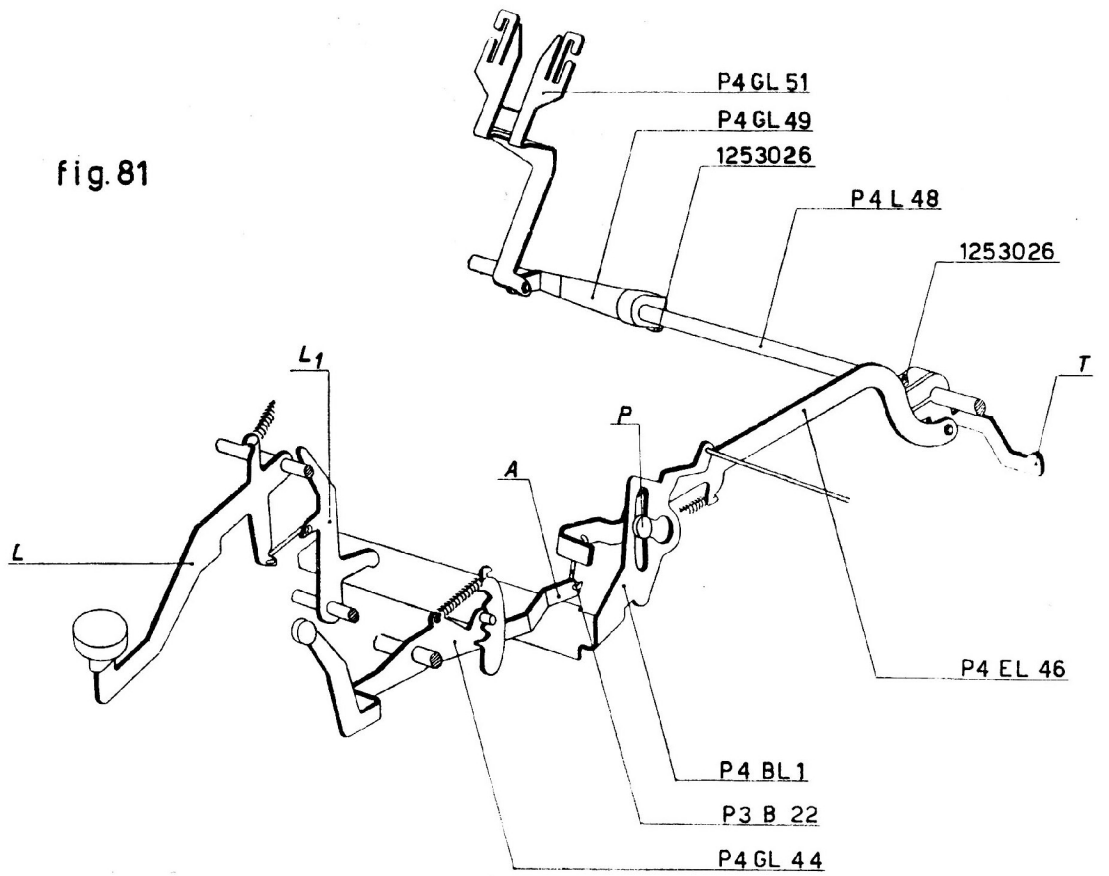
a) Place the two-colour change lever P4 GL 44 in the neutral (stencil) position (figure 81). Lower the levers of keys **L** which transmit the movement to the correspnoding first movement levers **L1**. The latter, through their rear shank, cause the ribbon operation control lug P4 BL 1 to turn. During the rotation, the horizontal slot in its right arm should not interfere with pin **P** of pull rod P4 EL 46. To obtain the required condition:

— check the parallelism of pull rod P4 EL 46 in relation to the right arm of the lug. If required, move the pull rod along its shaft P4 L 48;

— check that the ends of the slot do not touch the pin **P**. If they do touch, adjust the inclination of the rear part **A** of the two-colour change over lever P4 GL 44 by using pliers. In further detail: if the pin is touched above, lower part **A**; if it is touched below, raise it.

b) The tenon **T** of pull rod P4 EL 46 should be in contact with the lower face of the right side of the machine. If necessary, correct its position. When the required condition is reached, tighten securely screws 125 30 26 on the clamp of the pull rod P4 EL 46 (figure 81).

fig. 81



P4 L 48	Ribbon lift shaft	P4 GL 49	Second ribbon carrier crank
P4 BL 1	Ribbon operation control lug complete	P4 GL 51	Ribbon carrier
P4 GL 44	Two-colour change over lever	P3 B 22	Links for key levers
P4 EL 46	First ribbon carrier crank with pull rod	125 30 26	Special screw for P4 GL 51 - P4 EL 46

c) Raise the underscore type bar (6). It should arrive at the point shown in figure 82. The line of the underscore should be 0,8 ÷ 1 mm. (0.031 ÷ 0.04 of an inch.) higher than the upper edge of the ribbon. This adjustment is made by moving the second ribbon carrier crank P4 GL 49 as required (figure 81). When the regulation is effected, tighten up screw 125 30 26 of P4 GL 49.

d) Bring the two-colour change lever to black. Set the movable type bar segment on capitals.

When the keys are struck, the pull rod P4 EL 46 is moved forwards by lug P4 BL 1. Stank **A** of the pull rod, at the end of the stroke, is stopped by the lower eccentric P4 L 43 (1) (figure 83). The condition shown in figure 83a should be reached by raising the type bar by hand. The type should be 1 mm. (0.04 of an inch.) lower than the upper edge of the ribbon.

The adjustment is made by moving eccentric **I** previously mentioned, as required. If this is not effective, the position of shank **A** of pull rod P4 EL 46 must be corrected.

e) Bring the two-colour change lever to red. Keep the type bar segment on small letters. The condition shown in figure 84 should be reached; the type bar is flush with the upper edge of the ribbon. This adjustment is made by manipulating the upper eccentric **S** P4 L 43.

f) Make printing tests. Check that the ribbon does not smudge and that when on neutral (stencil) position, it makes no impression whatever.

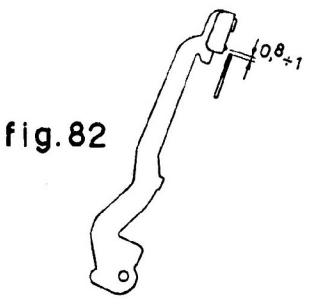


fig. 82

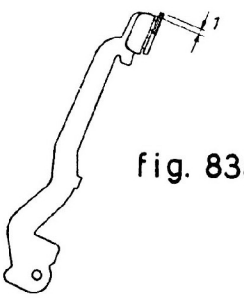


fig. 83a

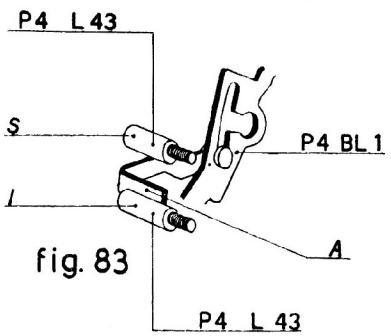


fig. 83

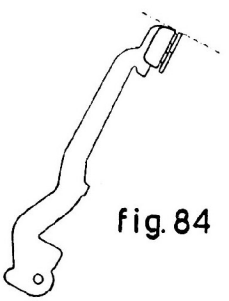


fig. 84

P4 L 43 — Eccentric for ribbon carrier stop

P4 BL 1 — Ribbon operation control lug complete

82 - FIGURES 85 and 85a

Adjustment of Shift Mechanism.

a) Regulate, with the eccentric M3 Q 10, the idle stroke of the shift keys, which should be minimum. This minimum, which is obtainable by adjusting the eccentric, will always be greater than the 1 mm. (0.04 of an inch.) required as idle stroke.

b) Reduce an excessive idle stroke by lowering bracket P4 EV 24.

c) Using pliers or setting tool, hend the shank **A** of the shift arm so that the type bar segment is locked on the small letters by the pressure exerted by the shank on the lower part **I** of the suspension rod P4 E 15.

The following conditions should be reached:

— the type bar segment locked on the small letters;

— there is no interference between the two opposed levers on changing from small letters to capitals;

— there should be the clearances indicated in figure 85a, between these levers.

d) Lower the capitals key slowly. The key should make the prescribed idle stroke of 1 mm. (0.04 of an inch.). It will then start moving the type bar segment. The latter stops as soon as shank **C** of its bracket makes contact with the lower rubber cap P4 G 12.

Lower the capitals key once more; the flexible coupling should function; this can be seen by observing the tension of spring M2 H 14. The tension is relieved when pin **P** is stopped at the bottom of the slot of pull rod P4 G 4 into which it is fitted.

Return the segment to the small letters position.

e) Lower the shift by pressing slowly the shift lock key M2 G 26. The lower shank **D** of lever P4 G 16 makes contact with edge **E** of bracket P4 EV 24 and subsequently slides down same. It should hook on almost at the end of the stroke of the flexible coupling, i. e. a little before pin **P** stops. This condition can be reached by adjusting, with a pair of pliers, the position of the inclined edge **E**.

The hooking position of the shift lock key is correct when it is obtained by lowering the right hand capitals key.

f) Place weights of 45 gr. on the shift keys and to one of them add a weight of 130 gr. The type bar segment should become slightly lowered. If a second weight of 130 gr. is added to the other key, the lowering of the segment should be obvious and decisive.

Remove one of the two 130 gr. weights; the segment should rise a little. Take away the other 130 gr. weight and the segment should return decisively to its rest position in spite of it being weighted with the original 90 gr.

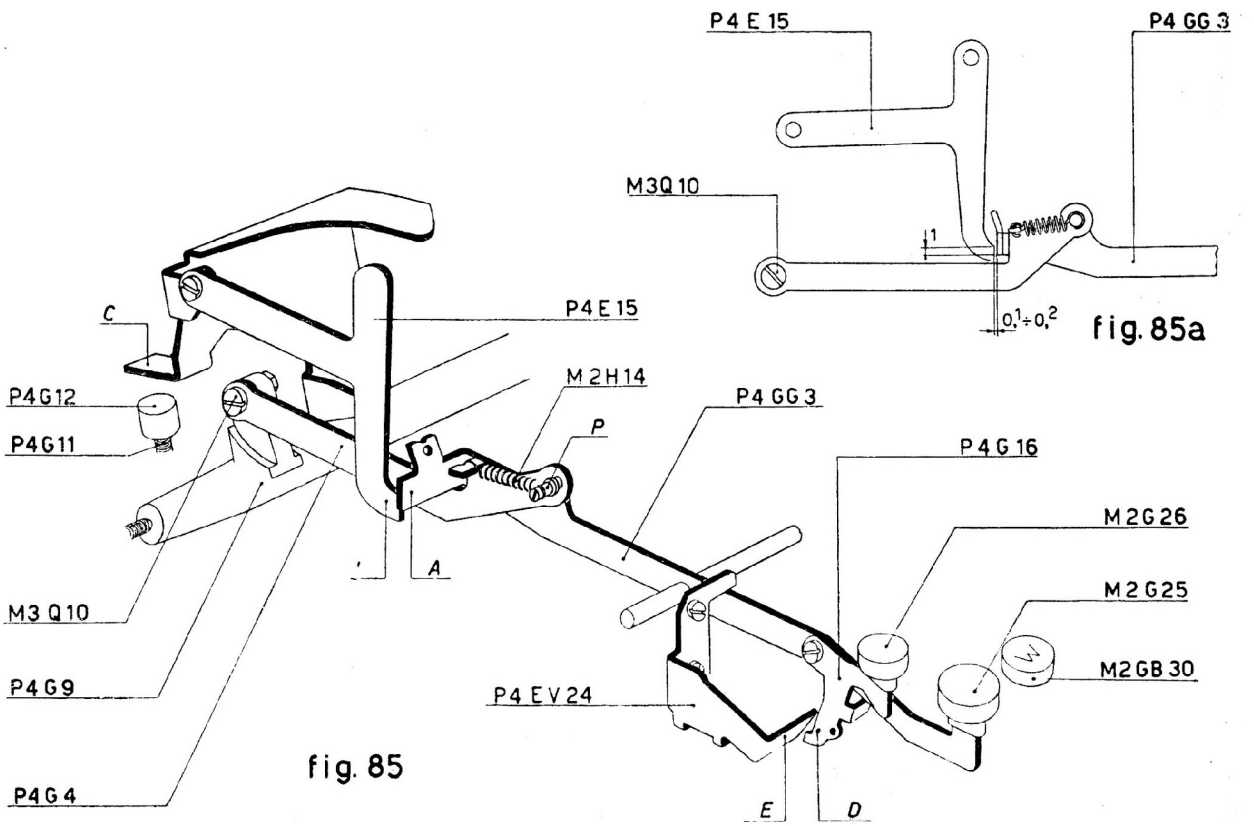


fig. 85a

fig. 85

P4	E	15	Left hand type bar segment suspension rod	P4 EV 24	Setting and clearing control lever bracket
P4	G	4	Shift pull rod	M2 GB 30	Key top
P4	G	9	Shift shaft with arms	M2 G 25	Shift key
P4	G	11	Shift regulator	M2 G 26	Shift lock key
P4	G	12	Rubber cap for shift regulator	M2 H 14	Spring for shift flexible joint
P4	G	16	Shift lock lever	M3 Q 10	Eccentric connecting stud for shift pull rod
P4	GG	3	Shift frame		

83 - FIGURE 86

Adjusting the trip of the space bar frame.

a) Hook spring N3 I 11 between the space bar control frame P4 H 3 and the bracket P4 V 73. Adjust the angle of the space bar control lever P4 GH 7 so that the first trip of the escapement comes at half stroke of the space bar. If a 60 gr. weight is applied on the latter, no movement should be observed. If a further 160 gr. weight is added, the space bar should be lowered sharply, tripping the carriage. When the 160 gr. weight is removed, the bar should return to its rest position, although weighted with the original 60 gr.

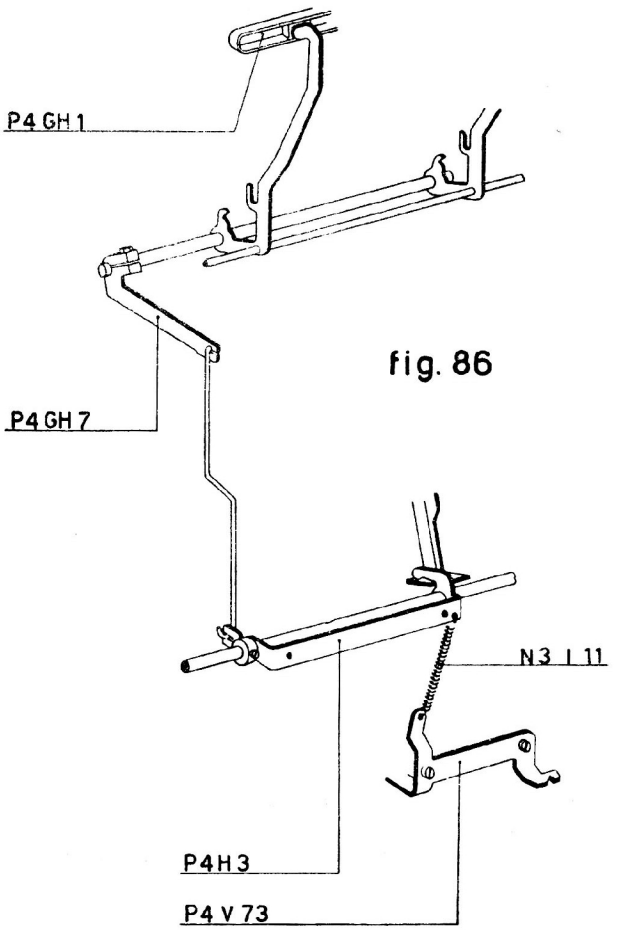


fig. 86

P4	H 3	Space bar control frame
P4	GH 1	Space bar
P4	GH 7	Space control lever
P4	L 27	Lug connection pull rod
P4	Q 1	Margin release link
P4	Q 2	Margin release bracket

84 - FIGURE 87

a) Connect the margin release control lever P4 Q 4 and the margin release bracket P4 Q 2 by means of link P4 Q 1.

b) Connect the key lever, locking frame P4 Q 10 and the locking control lever P4 EQ 8 with pull rod P4 L 27.

c) Using a pair of pliers, close the seats in which the link and the pull rod are resting.

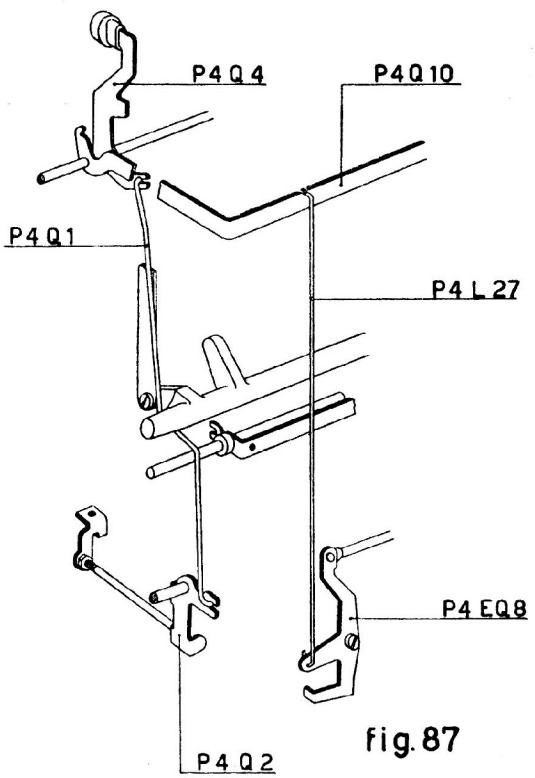


fig. 87

P4	Q 4	Margin release lever
P4	Q 10	Key lever locking frame
P4	EQ 8	Keyboard locking lever with frame locking shaft
P4	V 73	Stops and spring carrying bracket
N3	I 11	Spring for P4 H 3

85 - FIGURES 88 - 89 - 90 - 91 and 92

Adjustment of margin release rod P4 GQ 30.

a) Figure 88. The link M2 Q 38 should be vertical. If necessary, move the setting and clearing crank P4 GV 23 along P4 V 15.

Adjust the height of link M2 Q 38 so that the tenon **T** of the margin release rod barely makes brushing contact with the rear screws **V** of margin blocks when the margin release bracket P4 Q 2 is at rest.

b) Figure 89. Adjust the right hand regulator M2 Q 35. Keeping the margin release rod pressed up against it, a clearance of 9 mm. (23/64") should result as indicated in the figure.

Partially screw up the nut 138 40 5 of the adjusted regulator without locking it.

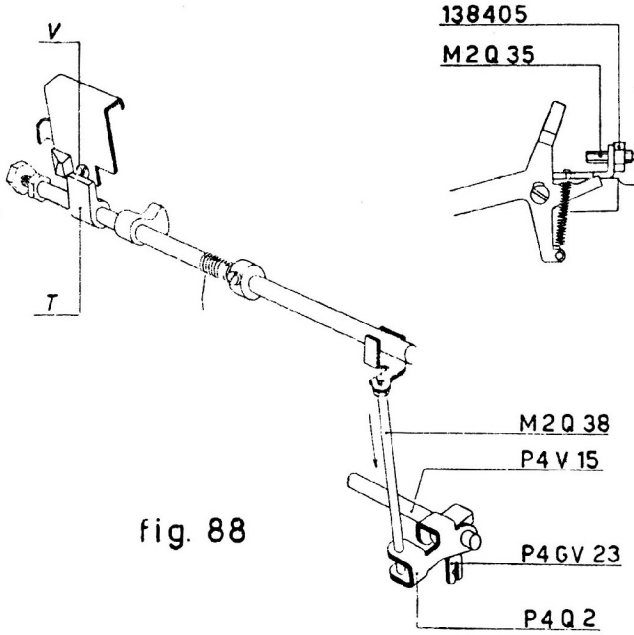


fig. 88

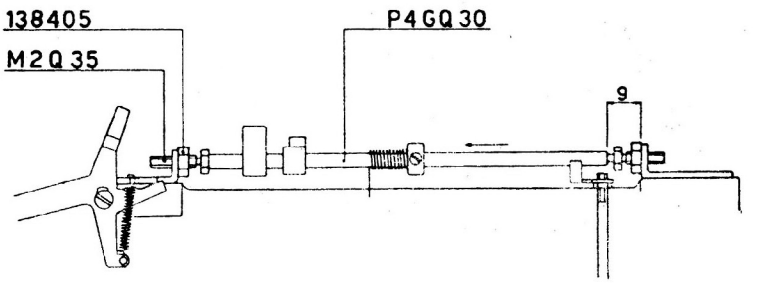


fig. 89

P4 Q 2	Margin release bracket	M2 Q 35	Headless support screw for margin release rod
* P4 GQ 30	Margin release rod		
P4 V 15	Tabulator control shaft	M2 Q 38	Upper vertical link of margin release
P4 GV 23	Setting and clearing crank	138 40 5	Hexagonal nut for M2 Q 35

* Specify spacing.

c) Figures 90 and 91. Final adjustment of the right hand regulator M2 Q 35.

— advance the carriage by operating the space bar. At the last space but one, a clearance of 0 ÷ 0,2 mm. (÷0,0008 of an inch.) should be seen between tenon **T** of the margin release rod and stop **T1** of the margin set. This distance is found when the shaft P4 GQ 30 is held in contact with the regulator M2 Q 35. The adjustment is made by moving the latter as required.

— if the adjustment has been exact, it should be observed that when the carriage is brought back to the beginning of a line, stop **T2** of the left hand margin set (figure 91) will hit the tenon **T** of the margin release rod; it will then recoil a distance of 1 mm. (0.04 of an inch.). This distance must be checked when rod P4 GQ 30 is held in contact with the right hand regulator M2 Q 35.

— tighten nut 138 40 5 of the regulator.

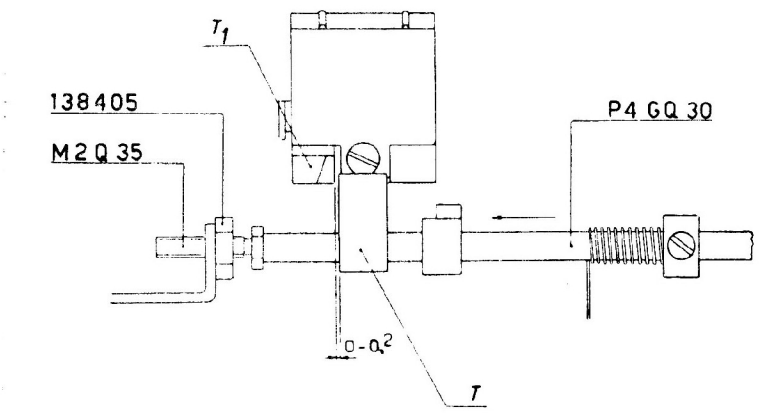


fig. 90

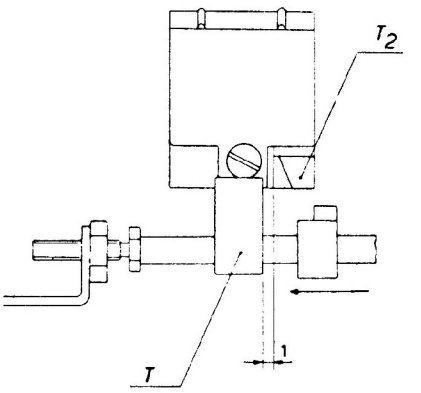


fig. 91

* P4 GQ 30	Margin release rod	138 40 5	Hexagonal nut for M2 Q 35
M2 Q 35	Headless support screw for margin release rod		

* Specify spacing.

d) Figure 92. Adjust the left hand regulator M2 Q 35 so as to obtain the clearance indicated in the figure.

86 - FIGURE 93

a) Keep the margin release rod P4 GQ 30 in contact with the right hand regulator M2 Q 35.

b) Move collar 142 51 8 so as to bring it to 0,05 ÷ ÷ 0,15 mm. (0,002 ÷ 0,06 of an inch.) from the keyboard locking vertical lever P4 Q 9.

87 - FIGURE 94

a) With the locking control lever P4 EQ 8 at rest, place the eccentric P4 Q 12 in the position shown in the figure (the projection **P** carries the fixed tooth spring).

b) Adjust the eccentric P4 Q 12. Moving the shaft of P4 Q 8 to the left, the eccentric should make brushing contact with the rear end of the universal frame P4 GE 20.

c) Lock screws 124 30 7 of eccentric P4 Q 12.

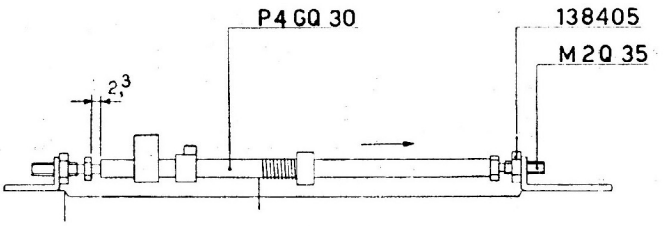


fig. 92

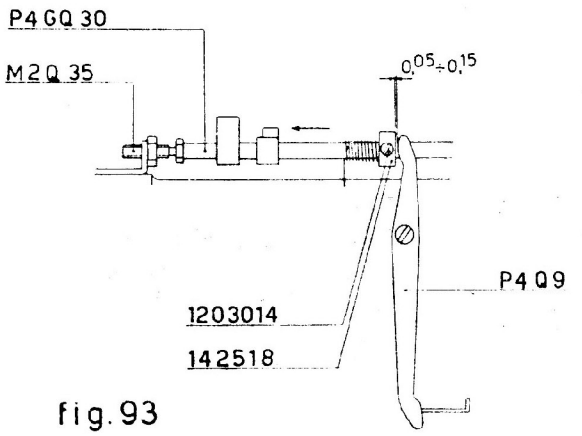


fig. 93

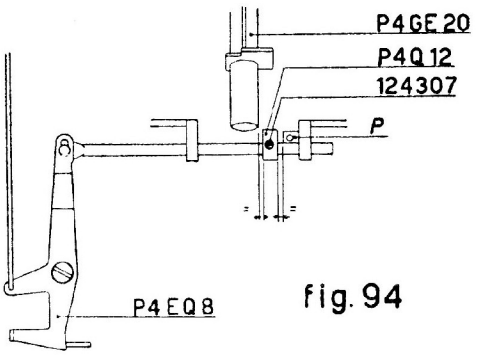


fig. 94

P4 GE 20	Universal frame complete	M2 Q 35	Headless support screw for margin release rod
P4 Q 9	Vertical keyboard locking control lever	120 30 14	Cheese head screw for 142 51 8
P4 Q 12	Frame locking eccentric	124 30 7	Grub screw for P4 Q 12
P4 EQ 8	Keyboard locking lever with shaft	138 40 5	Hexagonal nut for M2 Q 35
* P4 GQ 30	Margin release rod	142 51 8	Collar for P4 GQ 30

* Specify spacing.

88 - FIGURE 95

a) Connect the back space control lever P4 N 1 and the back space frame P4 EN 6 by means of pull rod P4 N 2.

b) Connect the tabulator control lever P4 V 1 and the tabulating frame P4 EV 12 with pull rod P4 V 3.

c) Using a pair of pliers close the seats where the pull rods are resting.

89 - FIGURE 96

Adjustment of back spacing.

The back space control key lever P4 N 1 should rest on the stop lever P4 A 10. The pawl **A** of the back space frame P4 EN 6 should not, when at rest, be in contact with guide stud M2 N 9, but must be 0,1 ÷ 0,2 mm. (0.004 ÷ 0.008 of an inch.) away from it. This avoids the metallic sound made by the pawl at the end of its return path.

The distance is adjusted shortening the pull rod P4 N 2, by careful bending, and then checking the angle between the upper and lower arms of frame P4 EN 6.

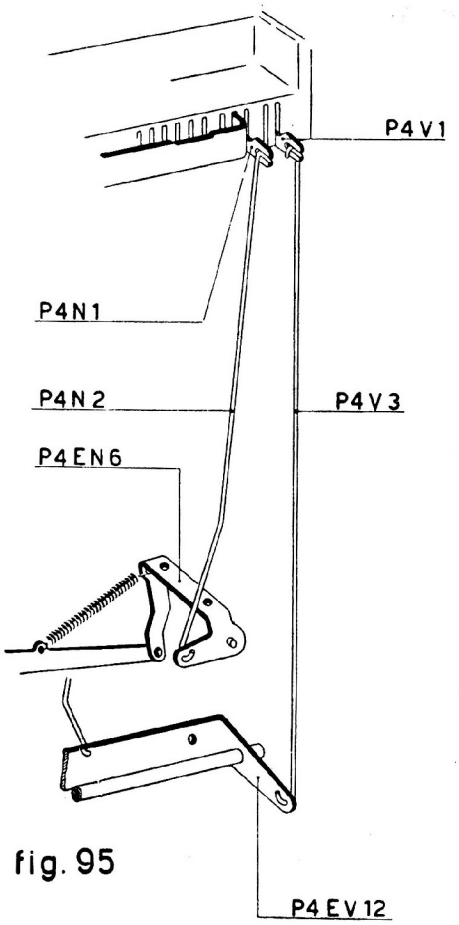


fig. 95

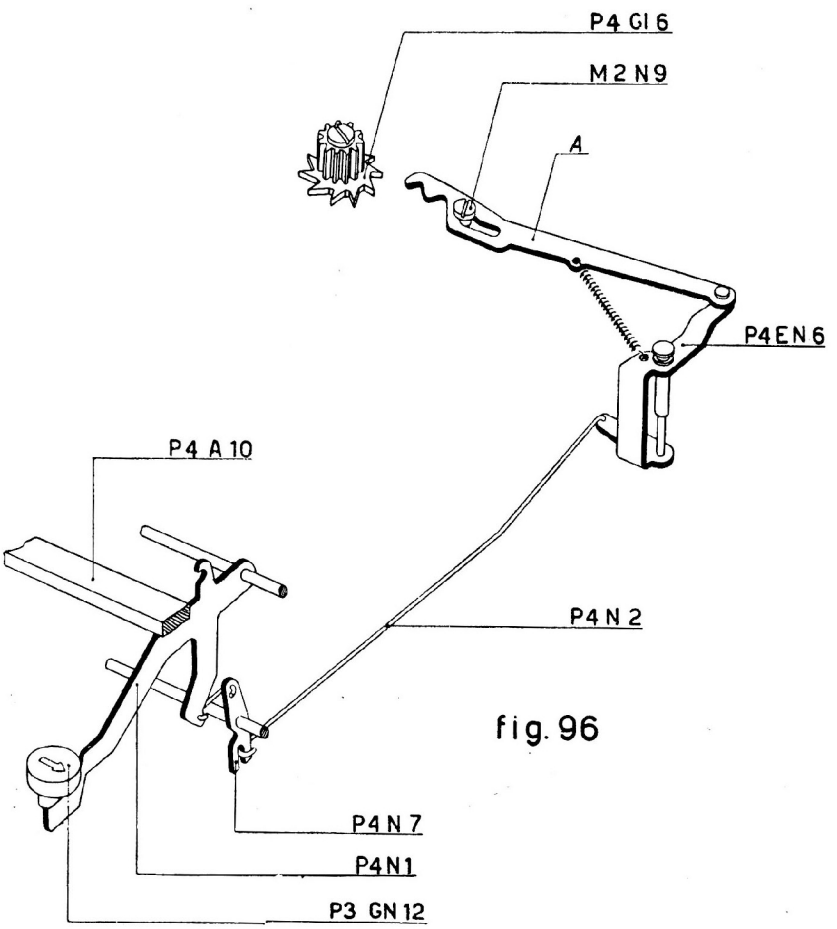


fig. 96

P4	A	10	Leather lever stop
* P4	GI	6	Escapement wheel and cogwheel
P4	N	1	Back space key lever
P4	N	2	Back space pull rod
P4	N	7	Back space and tabulator first movement lever
P4	EN	6	Back space pawl with frame
P4	V	1	Tabulator lever
P4	V	3	Tabulator control pull rod
P4	EV	12	Tabulator frame with bracket
P3	GN	12	Key for back space lever
M2	N	9	Large headed collet screw for back space

* Specify spacing.

90 - FIGURES 97 - 98 - 99 and 100

Adjustment of the setting and clearing cinematic chain.

a) Figure 97. The tabulator finger P4 EV 13 should be 1 ÷ 1,5 mm. (0.04 ÷ 0.06 of an inch.) clear of stops M2 V 82. To obtain this clearance, use two setting tools and correct the position of the rear shank **A** of the tabulator frame P4 EV 12. The tools should be applied at points **X** and **Y**. With this operation, the shank is raised or lowered; as a consequence, the tabulator finger will be raised or lowered accordingly.

b) Bring the left margin set to the fifth space and the carriage all the way over to the right. In this position the setter P4 V 36 should be centered in relation to the first stop on the left. To effect this, move the setting and clearing control P4 GV 30 along the shaft P4 V 15.

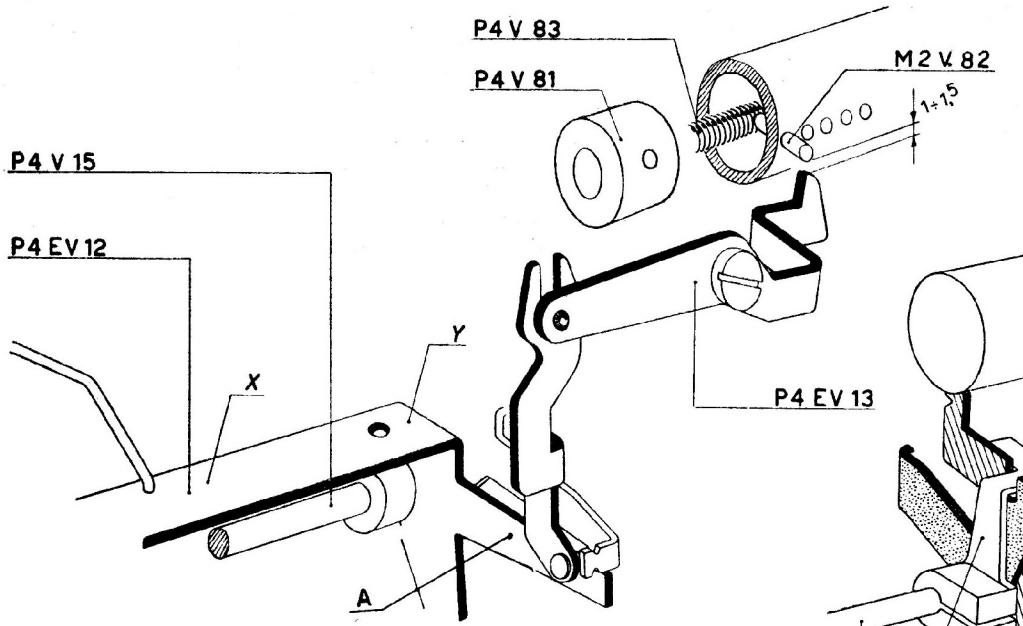


fig. 97

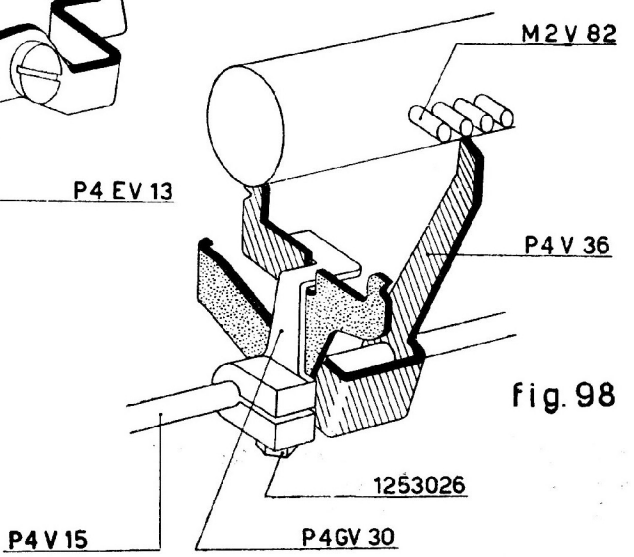


fig. 98

P4 V 15	Tabulator control shaft	P4 EV 13	Tabulator finger
P4 V 36	Setter	P4 GV 30	Setting and clearing control
P4 V 81	Plug for tube	* M2 V 82	Stop pins
P4 V 83	Coiled spring for stop tube	125 30 26	Special screw for P4 GV 30
P4 EV 12	Tabulator frame with bracket		

* Specify spacing.

c) Figure 99. The upper shanks of the setter P4 V 36 and the clearer P4 V 41 should be centered, in their position of rest, with respect to the stops. In addition, there should be a clearance of 1 mm. (0,04 of an inch. between stops set and not set, as well as between stops set and cleared.

To centre the P4 V 36 and the P4 V 41 in relation to the stops tube, adjust the angle of the setting and clearing control P4 GV 30. At rest, the P4 V 36 and the P4 V 41 should rest on the stops of the bracket P4 V 73. To obtain the prescribed clearance of 1 mm. (0.04 of an inch.) correct, if necessary, the points of support of the bracket itself.

b) Figure 100. Adjust the angle of the setting and clearing crank P4 GV 23 and the shaft P4 V 15. The control lever **L** should set and clear the stops and have and additional safety margin of travel. This should be equally divided in relation to the stationary points of lever **L**.

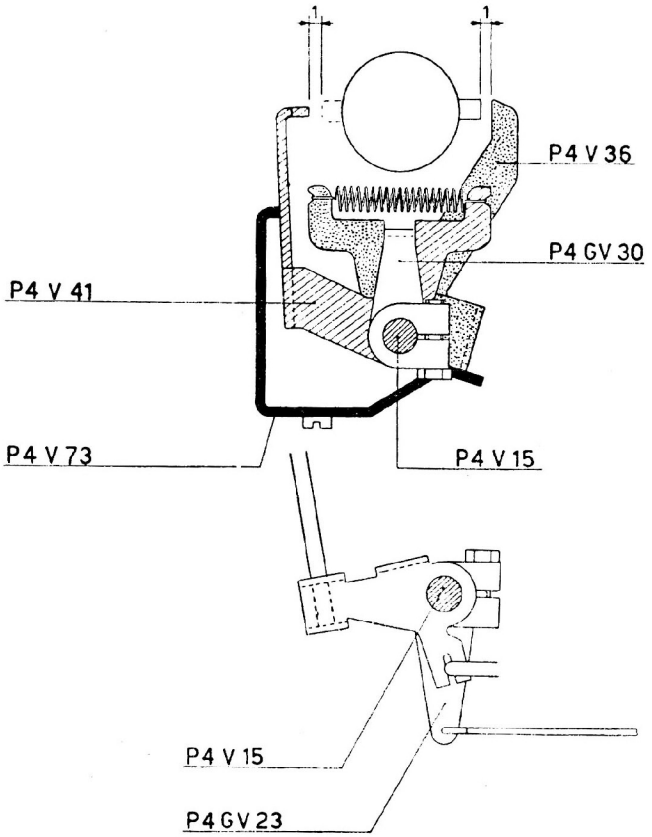


fig. 99

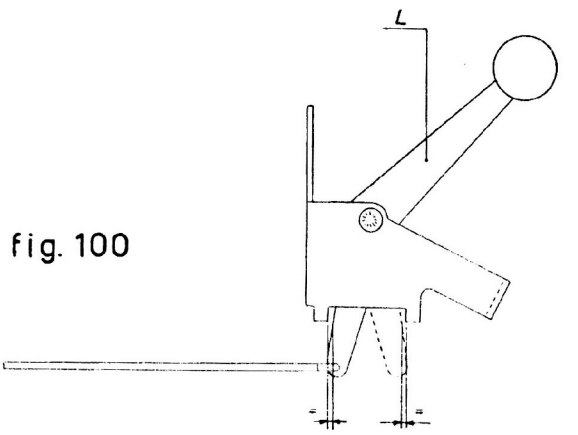


fig. 100

P4 V 15	Tabulator control shaft	P4 V 73	Stops and spring carrying bracket
P4 V 36	Setter	P4 GV 23	Setting and clearing crank
P4 V 41	Clearer	P4 GV 30	Clearing and setting control

91 - FIGURE 101

In its position at rest, the cork pad P4 V 75 of brake P4 GV 74 should be at a distance of 0,5 mm (0.02 of an inch.) from the stops tube.

This condition is reached by adjusting the position of the arm **B** which rests on shank **A** of the tabulator frame P4 EV 12. By raising or lowering this arm, the cork pad is brought nearer to, or farther from, the tube.

92 - FIGURE 102

When the tabulator control key is lowered, lever P4 V 14 moves the movable tooth P4 I 11 disengaging it from the escapement wheel.

The brake should come into contact with the stops tube before the movable tooth has completely left the teeth of the wheel. Further, the movement of lever P4 V 14 should not be such as to bring the right hand end of the movable tooth in contact with the projection **P** of the fixed guide. It should have a certain safety clearance in relation to the latter, as is also required in adjusting the carriage release bracket.

These conditions are reached by increasing or decreasing the ben of link P4 B 24/1.

93 - FIGURE 102

When at rest, the tabulator key should rest on the lever stop leather. Adjust the points **K** and **H** of the frame P4 EV 12 with setting tool, if required.

94 - FIGURE 101

Check that the brake functions correctly. The carriage must not be over braked or excessively free to slide.

If necessary, increase or relieve the tension of spring M2 B 25.

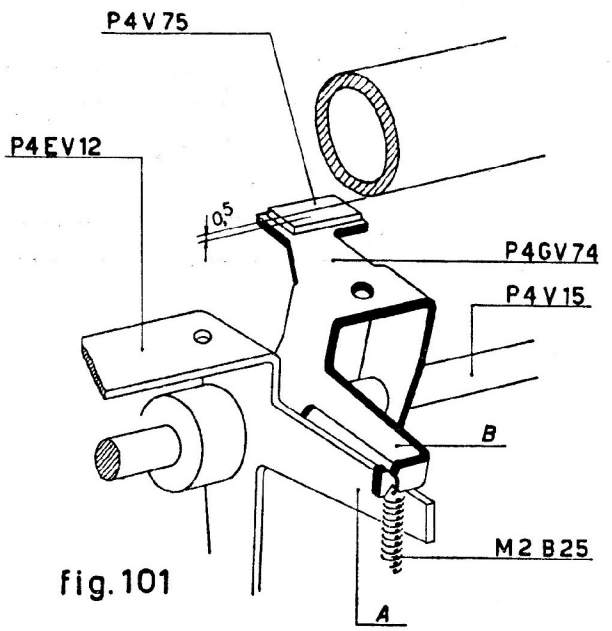


fig. 101

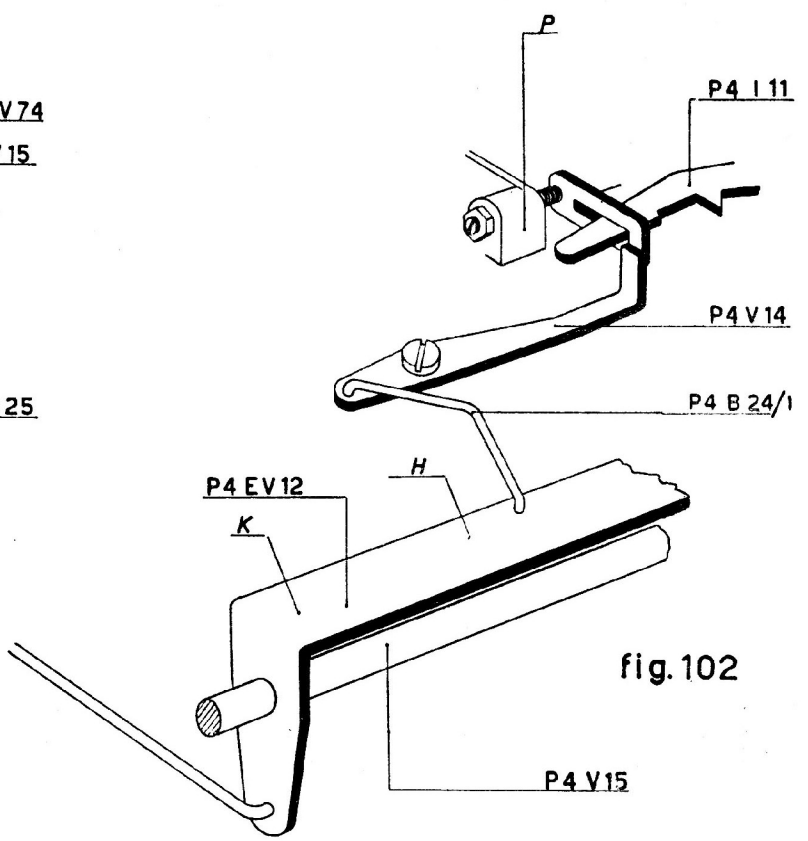


fig. 102

P4 B 24/1	First movement link	P4 V 75	Cork pad for carriage brake
P4 I 11	Escapement movable tooth	P4 EV 12	Tabulator frame with bracket
P4 V 14	Lever for disengaging movable tooth	P4 GV 74	Carriage brake
P4 V 15	Tabulator control shaft	M2 B 25	Spring for P4 GV 74

95 - FIGURES 103 and 103a

a) Bring the right hand margin set to the end of its travel. Slide the carriage along and check that there is a clearance of 0,2 mm. (0.008 of an inch.) between tenon **T2** of margin release rod and screw of safety stop when tenon **T** of the margin set comes into contact with tenon **T1** of the margin release rod.

This condition is reached by adjusting screw P4 T 24 as required.

b) The left hand margin set should be adjusted to the same clearance.

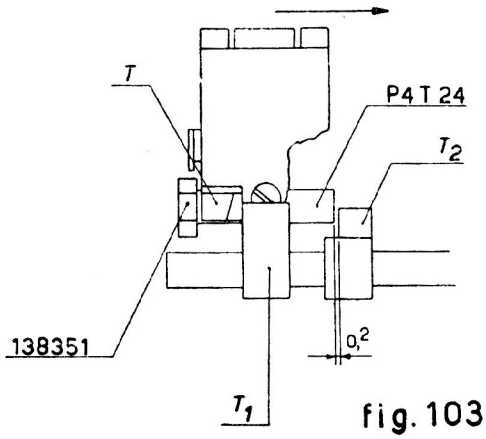


fig. 103

96 - FIGURE 104

Type a series of l.

With the line guide indicator in its normal printing position, the lower shanks of the l should be flush with the upper edge of the line guide indicator itself. In addition, the l and the notches of the indicator should be aligned on the same vertical.

97 - Check that the line guide indicators do not foul the sides of the movable guide and that they are parallel to the platen.

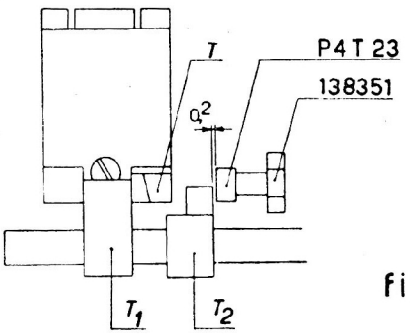


fig. 103a

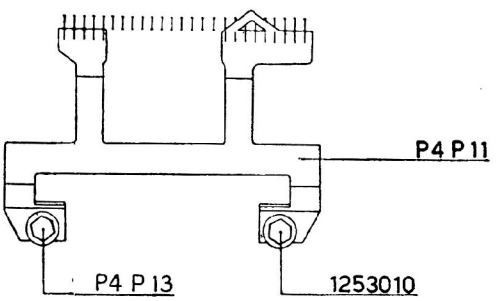


fig. 104

* P4 P 11	Graduated indicator
P4 P 13	Special screw for P4 P 11
P4 T 23	Left carriage safety stop
P4 T 24	Right carriage safety stop
138 35 1	Hexagonal nut for P4 T 23 - P4 T 24

* Specify spacing.

98 - FIGURES 105 and 105a

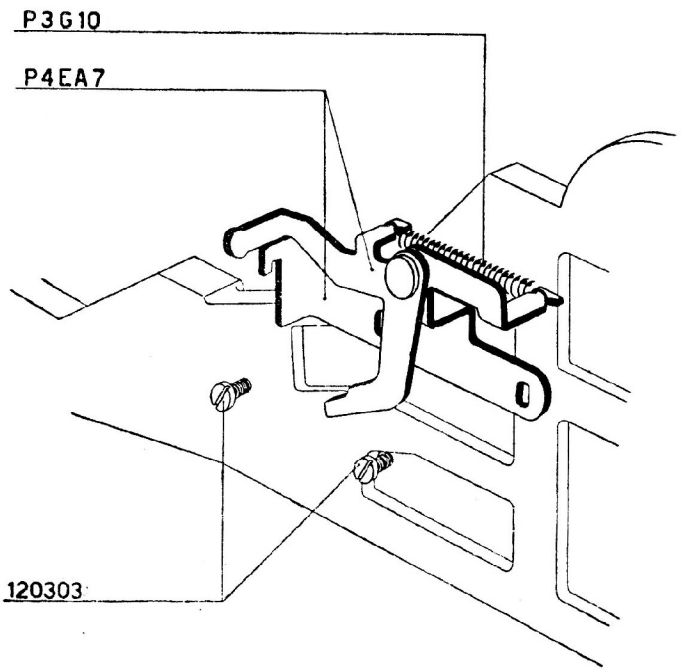
a) Arrange the spring P3 G 10 between the two articulated parts of the carriage locking bracket P4 EA 7. Mount the latter on the left side of the machine securing it with two screws 120 30 3 which should be partially screwed in and not tightened.

b) Place the locking lever in the hooking position. Adjust the height of bracket P4 EA 7 so that the rear shank of the locking lever makes light contact with the front rail of the movable guide **R**.

The lever is then inserted into the special slot in the rail. Tighten up screws 120 30 3 thoroughly.

99 - Remove the iron feet and the temporary rear brackets.

fig. 105



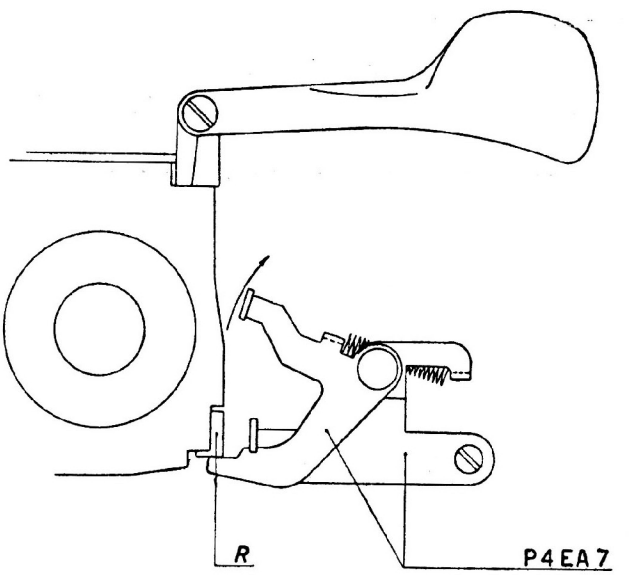


fig. 105a

P4 EA 7	Bracket with lever for locking carriage	120 30 3	Cheese head screw for P4 EA 7
P3 G 10	Spring for carriage stop hook		

100 - FIGURE 106

Assembling the cover P4 AA 17.

a) Place four rubber bushes P3 A 11 in the holes in the cover.

b) Move the carriage all the way over to the left.

c) Introduce the lower part of the cover from the left, fitting it into place on the machine.

d) Secure it with four studs 126 30 41, placing washers 40 40 6 in between.

e) Hook spring M2 R 6 on the snap lid of the cover. Fit the snap lid in place.

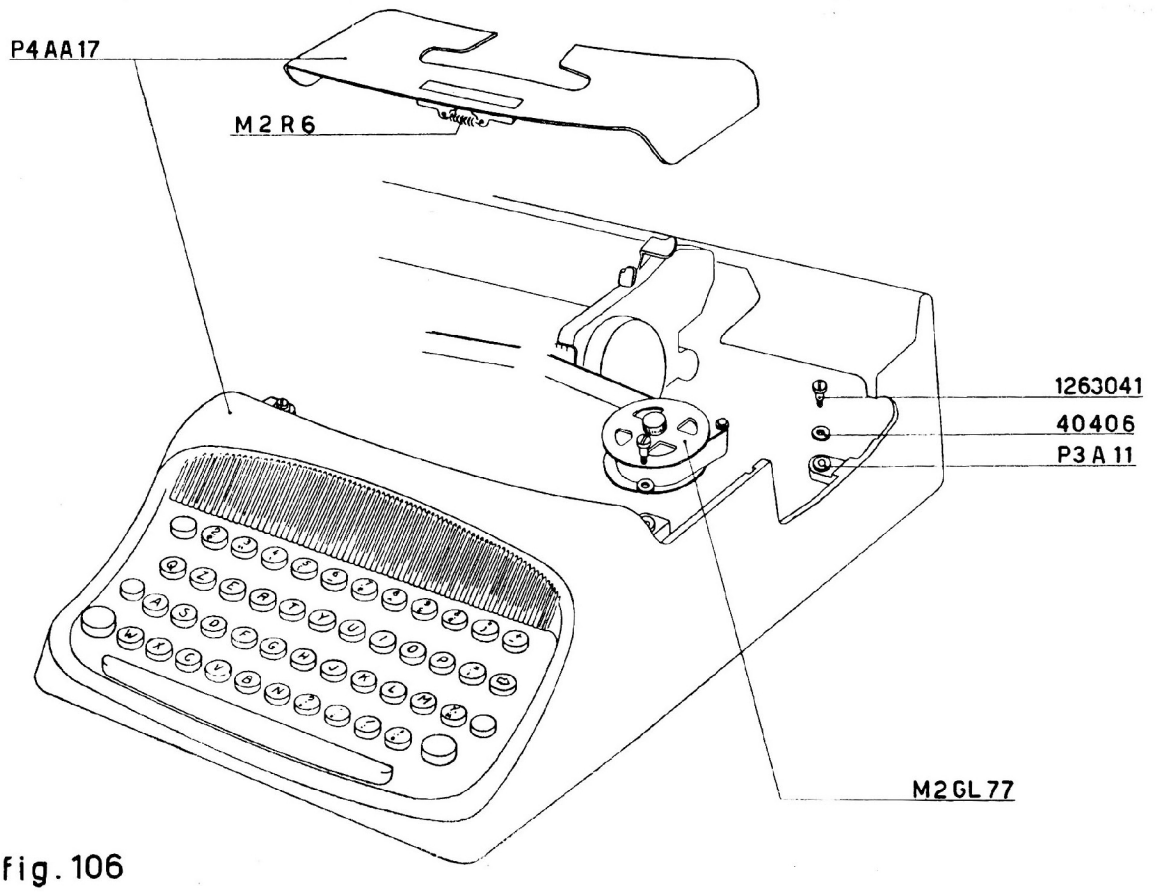


fig. 106

P4 AA 17	Cover with snap lid	M2 R 6	Spring for snap lid
P3 A 11	Rubber bush for fixing body	126 30 41	Cheese head stud screw for P4 AA 17
M2 GL 77	Ribbon spool	40 40 6	Washer for 126 30 41

101 - FIGURE 107

Assemble the base plate **P4 AA 22.**

Fit the small plates **P4 A 14** in the rubber feet P4 A 15 and secure the feet with studs 126 30 34.

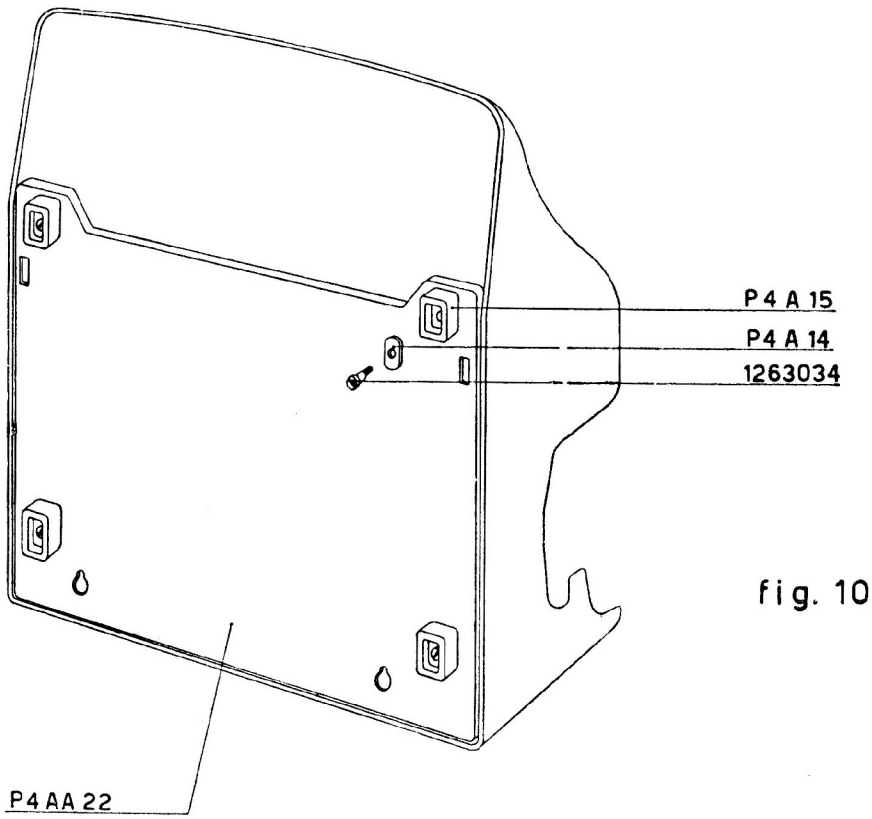


fig. 107

P4 A 14	**Plate for feet**	P4 AA 22	Base plate
P4 A 15	**Foot**	126 30 34	Cheese head stud for P4 A 15 - P4 AA 22

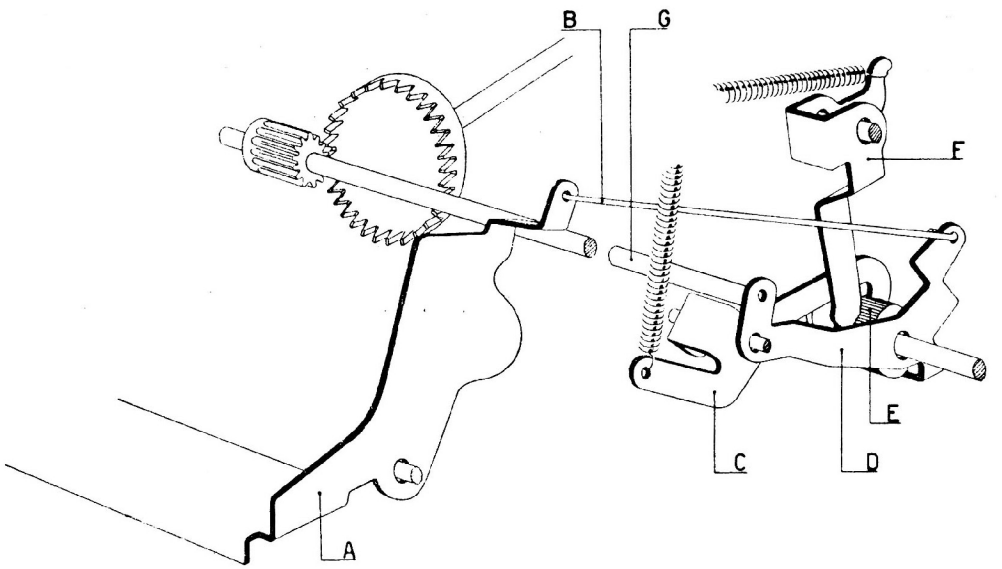
MODIFICATION OF THE FEED RIBBON MECHANISM

Beginning with serial number 782615 the feed ribbon mechanism has been modified.

Operations.

The front rotation of the lug controlling ribbon operation **A** makes rotate, by means of the pull rod **B**, the crank **D**. The movable pawl **C** has the same movement of the crank **D**, and its toothed end makes rotate the knurled pinion **E**. This last put into rotation the shaft **G**, which, by means of its two pinions, makes rotate one of the two ribbon spool.

When the lug return in its rest position, the pawl **C** jumps on the teeth of the pinion **E**. This last is kept in its new position by pawl **F**.



a) The new right ribbon carrying unit is shown in figure 108. The old bracket P4 EL 16 has been replaced by P4 EL 116 on which is riveted fixed pawl for ribbon advance **N**.

b) In place of the pinion P4 GL 105 and the frame P4 L 103 previously assembled on the horizontal shaft for ribbon advance, the following are now being used (figure 109):

— pinion P3 GL 6 with its screw 124 30 7;
— movable pawl for ribbon advance with crank P4 EL 204.

c) The spring 60 20 9 is hooked between bracket P4 EL 116 and P4 EL 204.

d) The spring 60 20 6 is hooked between the pawl **N** and the bracket P4 EL 116.

e) The adjustment of the ribbon return device is carried out as usual.

Superseded parts:		New parts:	
1 - P4 EL 16	Right spool shaft bracket.	1 - P4 EL 116	Right spool shaft bracket.
1 - P4 GL 105	Right pinion.	1 - P3 GL 6	Right pinion.
2 - P4 L 104	Spring for ribbon advance.	1 - 124 30 7	Screw for P3 GL 6
1 - P4 L 103	Ribbon advance frame.	1 - P4 EL 204	Movable pawl for ribbon advance with crank.
		1 - 60 20 6	Spring for right ribbon carrying unit pawl.

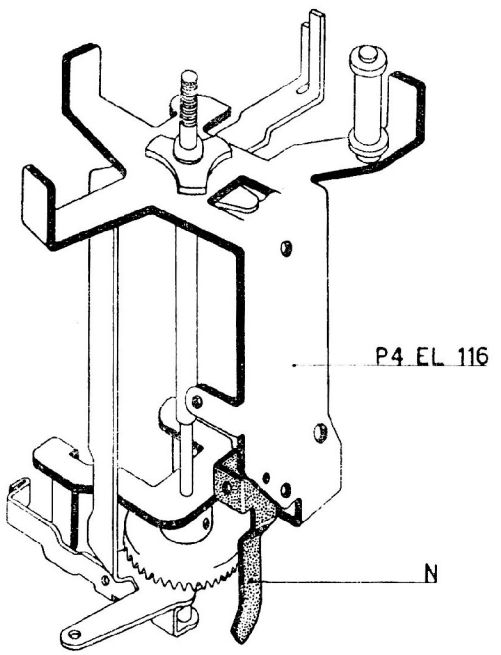


fig. 108

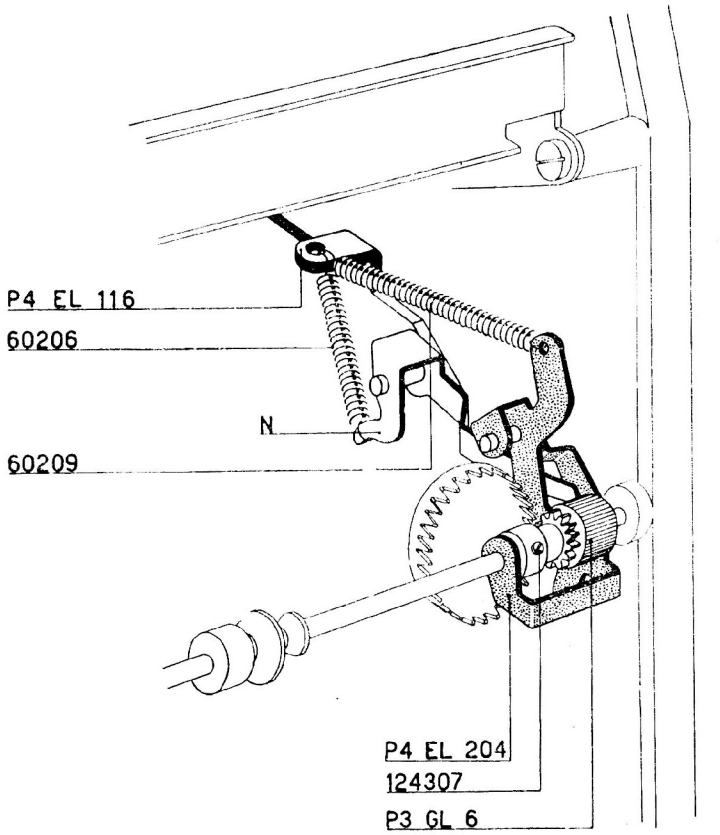


fig. 109

P4 EL 116	Right spool shaft bracket	124 30 7	Screw for P3 GL 6
P4 EL 204	Movable pawl for ribbon advance with crank	60 20 6	Spring for P4 EL 116
P3 GL 6	Right pinion	60 20 9	Spring for P4 EL 204

Testing.

By testing is meant the entire range of test operations which must be carried out in order to ensure that the machine performs satisfactorily and does all it was designed to do.

The mechanic should therefore intervene in the case where, during testing, it becomes clearly evident that some device is not functioning perfectly.

It is preferable and more convenient to use the special test forms. These enable a complete check of all the devices in the machine to be made in about 13 minutes.

Using these forms, the following operations must be carried out:

a) Remove the cover from the body and, moving the carriage from left to right, make certain that the various parts of the machine are in good condition.

b) put test ribbon in machine;

c) insert two sheets of light weight paper (copy sheets), with carbon paper, on the platen, type a few lines and see that the type does not cut the paper and that the typing is uniform. Take out the paper and make sure that it is not wrinkled;

d) repeat the test with five copy sheets and corresponding carbon paper; type **L** and check that even the last copy is sufficiently clear;

e) repeat the test with cards;

f) set two-colour lever on neutral (stencil), lower the space bar and keep it down. Strike all the keys one after the other and make sure that each type bar is completely free. Set the two-colour lever back to black;

g) insert the test sheet, checking the alignment with one of the printed lines. Write the data relative to the machine, shown by the machine itself and carry out the following tests:

1) Inking and alignment: lock the shift on capitals and strike all the keys lightly, alternating the different letters or numbers with the letter H. Ensure that all the letters are equally inked at the top and the bottom and that they are all perfectly aligned with the letter H.

2) Return the shift to small letters and repeat the test, making certain that the same conditions obtained.

3) Shift: type a series of letter h, one small letter and one capital and then repeat the typing with the letters m, k, x, l. The lower edges of all the letters should be perfectly aligned.

4) With the two-colour change lever on black, strike a series of the characters which are the highest and the lowest; on the English keyboard these are / - ( ) % Q. Check that none of these characters are defective or smudged with red.

5) With the two-colour lever on neutral (stencil) repeat the typing of the same letters and check that the ribbon remains at rest. After a few strokes the typing will disappear completely.

6) With the two-colour lever on red, repeat the typing and check that no character is defective or smudged with black.

7) Ribbon carrier: when the two-colour lever travels from one position to the other, the ribbon carrier can move, but the ribbon should not go beyond the upper edge of the indicator. Carry out the following test as well: with the lever in the black position and the touch control in position 1, the ribbon carrier should not move when the shift is operated. Repeat the test with the touch control in position 4 where a movement of 1 mm. may be allowed.

8) Trips: carefully watching the typing during the tests on inking and alignment, and the shift and two-colour device tests, enables the operator to check that the letters are uniformly spaced and that the trip mechanism is therefore functioning properly.

9) Right-hand ribbon reverse: wind the ribbon on the left-hand spool, turning it by hand until the small left hook of the ribbon is near the right lug of the reverse control. At this point, type a series of letters and check that the ribbon reverses correctly without being stretched too taut.

10) Left-hand ribbon reverse: carry out the same operation for the other half of the reverse device.

11) Indicators: type a series of the letter i. Bring the indicator close to the platen with the hand and check that the graduations of the indicator are in line with the letters and that the bottom of these coincide with the upper edge of the indicator. Check that the indicators are parallel to the platen. Turn the platen by hand until the row of i reaches the bail bar. Check that the graduations on the bar are in line with the letters.

12) Back space: strike alternateley the i key and the space bar. Set the shift on capitals and strike an I after the last i. Operate the back space key three times consecutively and strike another I; this should be printed between two i; repeat until all the I are between all the i.

13) Clutch: operating the clutch, move the platen so as to type on the line prepared on the form.

14) Zero position: set the line space selector lever on zero position and move the platen so as to type successively on the various lines prepared for this purpose on the form.

15) Line spacing position: replace the line space selector lever in operating position and turn the platen, without using the clutch, until it is brought to the line; the printing should be in the identical position as that reached previously with the use of the clutch.

16) Margin setting: strike two full stops in the positions marked on the form for the left and right-hand margins. Place the two margin stops in position corresponding to the full stops and type a line, making sure that the locking of the keyboard and the space bar takes place correctly when the right-hand margin is reached and that letters do not pile on top of each other in the last space.

17) Indenting: lower the margin release key and return to the beginning of the line using the line spacing lever. The carriage should stop the number of spaces set before arriving at the margin. Return to the beginning of the line and type another complete line between the two margins. Continue to type up to the right-hand margin.

18) Margin release: return to the beginning of the line. Press the margin key and bring the carriage further to the right. Type a line. The carriage should pass back over the margin without difficulty. When the right-hand margin stop is reached, press the margin release key again.

It should be possible to continue typing up to the extreme right-hand end of the platen.

19) Column selector or tabulator: strike 4 full stops in the positions indicated on the form and set four stops to correspond with their positions: type a series of figures or words in columns. Clear the stops at the points indicated on the form. After having carried o ut the complete series of tests, move the carriage along the full length of its path, at the same time operating the clearer. Bring the carriage back to the beginning of the line and press the tabulator key. The carriage should run freely the whole length of its path.

20) Type, in the space provided, the results of the various tests indicated here.

21) Line spacing: place the line space selector lever in position 1 and set the margin conveniently. Strike the space bar and go back to the beginning of the line using the line spacing control lever. Repeat this operation several times. Place the line space selector lever in position 2. Strike the space bar two or three times and move the left-hand margin stops to the right until it stops. Strike the bar again and go back to the beginning of the line using the line spacing lever. Repeat this operation several times. Continue with these tests for the other positions of the line spacer.

22) Make the final typing test by typing the standard text printed on the form.

Maintenance

Maintenance.

The Studio 44 machine is shipped to the Sales organization already lubricated. On account of the manufacturing methods and its funcional features it can be used for a number of years without the need for further lubricating.

The use of excessive oil is not recommended; it should be used only in cases of complete overhaul or washing of the machine.

For good maintenance it is necessary to:

— carefully remove dust and accumulated waste matter from erasures from the inside of the machine;

— clean the type carefully after having laid a strip of cloth under them. Clean them with the special brush. If they are very dirty a little gasoline may be used, taking care not to let drops fall on the type bars;

— lubricate, if it is really necessary, the escapement pinion, the various points of coupling, the pivot studs, the seats of the pull rods and links of the cinematics. Use vaseline oil;

— clean the guide slots of the guide comb carefully with a dry brush; do not lubricate;

— polish all chrome plated parts with a dry cloth;

— clean the cover carefully, using the special cleaner if necessary.

Parts Catalog

Spare parts are specified by code symbol, and name, for speedy and sure identification; code symbols and, if possible, the name should always be quoted when ordering spare parts or when submitting reports of mechanical defects, etc.

Spare parts are divided into three classes, viz.

Special parts, standard parts and units.

Special parts.

These consist of a single piece and are made for use on a particular machine. Their code symbols embody the following elements:

a) A key letter (or group letters or numbers) which indicates the machine in which the part is used. (Example: P4 = Studio 44).

b) A base letter (or group of letters) indicating the device in which the special part is used. (Example: P4-G = = Shift mechanism).

c) A number which clearly distinguishes a special part from all others used in a particular device. (Exampl: P4 - V - 1 = Tabulator lever).

Standard parts.

These consist of a single piece and are for the purpose of holding together, fixing and guiding. Since they can be used in different parts, devices and machines, their symbols do not contain key or base letters but are made up of the following groups of figures:

First groups: Defines the type and is formed of two or three digits. Three digits in the first group signifies that the part has a metric thread. The first of the three figures is always 1. (Example: 40... Washer; 120... Metric thread cheese head screw).

Second group: States the principal dimension intenths of a millimetre and is formed of two figures. (Example: 120 35... Metric thread cheese head screw, 3.5 mm. diameter).

Third group: Serves to distinguish between the various kinds of standard parts of the same type and principal dimensions. (Example: 120 35 2... Metric thread cheese head screw, 3.5 mm. diameter, type 2).

Units.

These consist of groups of two or more special parts or standard parts. If the grouping is effected at the factory it is known as a *shop unit*. The symbol for a shop unit is the symbol of the principal part of the unit with the addition, before the base letter, of one of the letters **E - G - H.**

If the grouping of special and standard parts is such as can be carried out with the means at the disposal of the Technical Service Department Workshops, the unit is known as an *assembly unit*.

The symbol for an assembly unit is the symbol of the principal part of the unit with the addition, before the base letter, of one of the letters **A - B - C - D.** These letters denote an ordered classification of units in cases where a unit comprises one or more sub-units.

FINDING THE SYMBOL

From the illustrations.

Compare the part with its illustration which will be found among the figures given in the instructions for assembly and adjustment (page 62 onwards). In these figures each part is shown with its appropriate code symbol. For easy and speedy reference, a list of the names and symbols of the parts appearing in each figure is given on the page facing the figure.

From the spare part list.

In order to facilitate the accurate checking of spare part orders, a list of all the specal parts, units and standard parts used in the « Studio 44 » will be found on page 208 and the pages following.

To assist the storekeeper, a short line has been printed, to the left of each symbol, on which may be written the number of the box, drawer or bin containing the part. At the side of each spare part is shown also the page number (or numbers) wherein reference is made to the particular part.

The parts have been listed in the following order:

1st. *Special parts and units distinguished by key letter P4 (Studio 44), grouped to the base letter:*

A = Frame - Cover;
B = Cinematic, Keyboard levers, first and second movement, touch control;
E = Type bars, universal frame;
G = Shift mechanism;
H = Space bar mechanism;
I = Escapement, rack;
L = Ribbon feed and reverse, two-colour device, ribbon carrier;
N = Back spacer;
O = Main spring;
P = Fixed guide;
Q = Lever stops, margin release, bell;
R = Movable carriage guide, lower and upper paper feed;
S = Carriage release;
T = Margin setting;
U = Platen, clutch, line spacing, platen knobs;
V = Tabulator.

2nd *Special parts and units distinguished by different key letters.*

These parts will also be found in the catalogues of the machines for which they were originally intended.

M2 = M 80; **M3** = M 80 El; **P3** = MP 3; **N3** = MC 14.

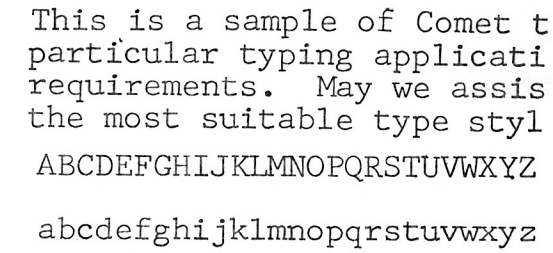
3rd *Standard parts grouped according to type.*

When the first group is composed of three figures (metric thread), the numerical order of the symbol ignores the first figure which, as previously explained, is always 1.

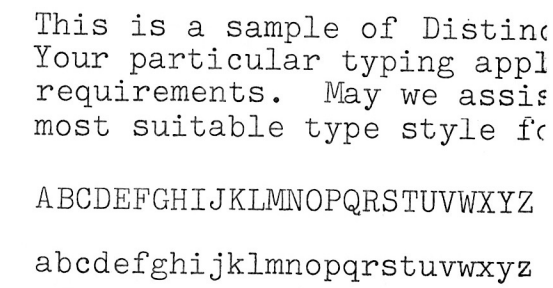
Example: **1 39** round nuts;
40 Washers;
1 42 Collars;
44 Split washers.

Reference: Olivetti Typefaces

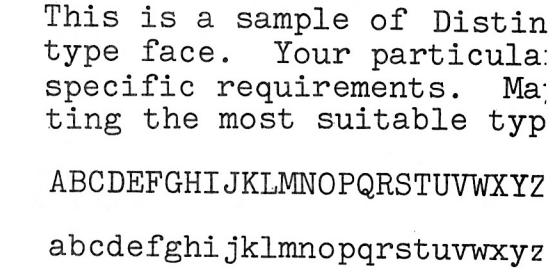
OLIVETTI COMET 10 Pitch 6 lines to an inch



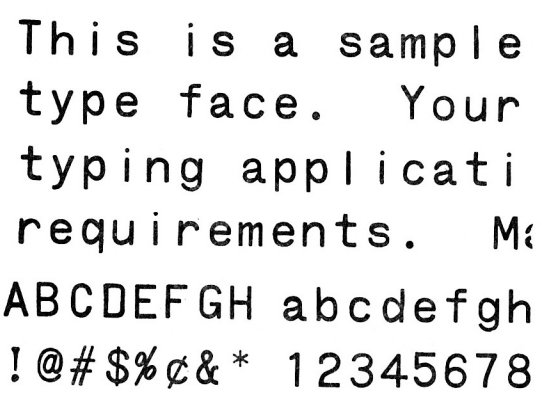
OLIVETTI DISTINCTIVE PICA 10 Pitch 6 lines to an inch



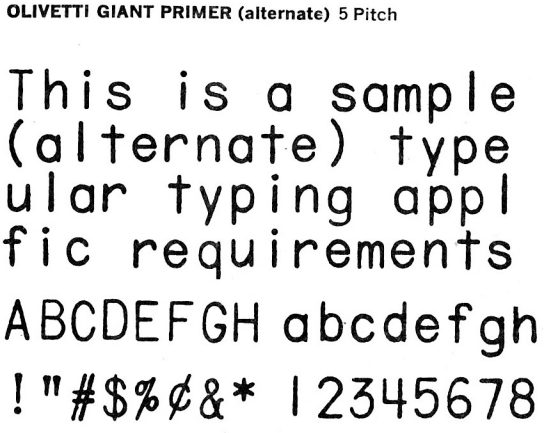
OLIVETTI DISTINCTIVE PICA HEAVY FACE 10 Pitch 6 lin



OLIVETTI BULLETIN 5 Pitch 3 lines to an inch



OLIVETTI GIANT PRIMER (alternate) 5 Pitch



This is a specimen of Underwood
Vertical Script Type
10 Pitch 1234567890

This is a specimen of
UNDERWOOD DISTINCTIVE PICA
type 10 PITCH 1234567890

This is a specimen of
UNDERWOOD STYMIE Type
10 PITCH 1234567890

This is a specimen of UNDERWOOD
WIDE ELITE VICTORIA TYPE
10 PITCH 234567890

This is a specimen of UNDERWOOD
MEDIUM ROMAN Type 10 PITCH
1234567890

This is a specimen of UNDERWOOD
SMALL VICTORIA Type 10 PITCH
1234567890

This is a specimen of UNDERWO
ELITE CORRESPONDENCE GOTHIC T
10 PITCH 234567

This is a specimen of
UNDERWOOD PICA VICTORIA Type
PITCH 1234567890 or 1234567

This is a specimen of Underwo
ITALIC type
10 Pitch 12345678

This is a specimen of UNDERWO
DISTINCTIVE ELITE Type
10 PITCH 12345678

This is a specimen of
UNDERWOOD WIDE ELITE Type
10 PITCH 1234567890

THIS IS A SPECIMEN OF
UNDERWOOD PICA GOTHIC CHECK
PERFORATING TYPE
10 PITCH 1234567890

This is a specimen of
Underwood Old English
Type 8 Pitch 1234567890

This is a specimen of
UNDERWOOD WIDE VICTORIA
8 PITCH 123456789

This is a specimen of
UNDERWOOD GREAT PRIMER
Type 8 PITCH
1234567890

This is a specimen
of Underwood
GIANT PRIMER type
6 Pitch 123456789

This is a specimen of Underwood
ELITE STYMIE UNIT SPACE TYPE
12 PITCH 1234567890

THIS IS A SPECIMEN
OF UNDERWOOD WIDE
GOTHIC TYPE 6 PITCH
1234567890

This is a specimen
of Underwood
BULLETIN type
6 Pitch 1234567890

THIS IS A SPECIMEN
OF UNDERWOOD EXTRA
LARGE GOTHIC TYPE
6 PITCH 1234567890

THIS IS A SPECIMEN OF UNDERWO
PICA GOTHIC TYPE
10 PITCH 12345678

THIS IS A SPECIMEN OF UNDERWO
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10 PITCH 12345678

This is a specimen of
UNDERWOOD ELITE VICTORIA Type
12 PITCH 1234567890

This is a specimen of Underwood ELITE ITALIC type 12 Pitch
1234567890

This is a specimen of UNDERWOOD
MICROTYPE 12 PITCH
1234567890
or
1234567890

This is a specimen of
UNDERWOOD DISTINCTIVE ELITE Type
12 PITCH 1234567890

THIS IS A SPECIMEN OF UNDERWOOD
ELITE GOTHIC TYPE 12 PITCH
1234567890

THIS IS A SPECIMEN OF UNDERWOOD
CONDENSED ELITE GOTHIC TYPE
12 PITCH 234567890

This is a specimen of UNDERWOOD
ELITE GOTHIC HEAVY FACE Type
12 PITCH 1234567890

This is a specimen of
Underwood CONDENSED MICROTYPE
16 Pitch 1234567890
Also available 1234567890

This is a specimen of UNDERWOOD SMALL GOTHIC Type
16 PITCH 1234567890

THIS IS A SPECIMEN OF
UNDERWOOD CONDENSED ELITE GOTHIC TYPE 16 PITCH
1234567890 ALSO AVAILABLE 1234567890

This is a specimen of
UNDERWOOD LIBRARY GOTHIC
type 9 PITCH
1234567890

THIS IS A SPECIMEN OF
UNDERWOOD CONDENSED ITALIC
TYPE 9 PITCH 1234567890

OLIVETTI STYMIE HEAVY FACE 10 Pitch

This is a sample of Stymie H
Your particular typing appli
requirements. May we assist
most suitable type style for

ABCDEFGHIJKLMNOPQRSTUVWXYZ

abcdefghijklmnopqrstuvwxyz

OLIVETTI STYMIE GOTHIC 10 Pitch 5.4 lines to an inch

This is a sample of Stymie G
Your particular typing appl
requirements. May we assist
the most suitable type style

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abcdefghijklmnopqrstuvwxyz

OLIVETTI UNIVERSAL PICA 10 Pitch 6 lines to an inch

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OLIVETTI ELITE GOTHIC HEAVY FACE 10 Pitch

This is a sample of Elite G
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OLIVETTI ELITE CORRESPONDENCE GOTHIC 10 Pitch

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type face. Your particular
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OLIVETTI ESQUIRE 10 Pitch 5.4 lines to an inch

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Your particular typing appl
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for your needs?

ABCDEFGHIJKLMNOPQRSTUVWXYZ

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OLIVETTI MONZA 10 Pitch 5 lines to an inch

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OLIVETTI ESTEEM PICA 10 Pitch 5.4 lines to an inch

This is a sample of Esteem
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OLIVETTI PICA GOTHIC 10 Pitch 6 lines to an inch

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THE MOST SUITABLE TYPE STYLE

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ABCDEFGHIJKLMNOPQRSTUVWXYZ

OLIVETTI PICA GOTHIC SHIFTLESS ALPHABET 10 Pitch

THIS IS A SAMPLE OF PICA GO
ALPHABET TYPE FACE. YOUR P
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ASSIST YOU IN SELECTING THE
TYPE STYLE FOR YOUR NEEDS?

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OLIVETTI PICA VICTORIA 10 Pitch 5.4 lines to an inch

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OLIVETTI STYMIE 10 Pitch 5.4 lines to an inch

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OLIVETTI ELITE VICTORIA 12 Pitch 5.4 lines to an inch

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requirements. May we assist you
the most suitable type style for

ABCDEFGHIJKLMNOPQRSTUVWXYZ !@#$%

abcdefghijklmnopqrstuvwxyz 12345

OLIVETTI ESTEEM ELITE 12 Pitch 5.4 lines to an inch

This is a sample of Esteem Elite
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most suitable type style for your

ABCDEFGHIJKLMNOPQRSTUVWXYZ !@#$%

abcdefghijklmnopqrstuvwxyz 1234

OLIVETTI FINANCIAL GOTHIC 12 Pitch 6 lines to an inch

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Your particular typing applicatio
requirements. May we assist you
most suitable type for your need

ABCDEFGHIJKLMNOPQRSTUVWXYZ !@#$%

abcdefghijklmnopqrstuvwxyz 1234

OLIVETTI WIDE ELITE VICTORIA 10 Pitch 5.4 lines to an in

This is a sample of Wide El
face. Your particular typi
specific requirements. May
selecting the most suitable
your needs?

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OLIVETTI DISTINCTIVE ELITE 12 Pitch 6 lines to an inch

This is a sample of Distinctive
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requirements. May we assist you
most suitable type style for you

ABCDEFGHIJKLMNOPQRSTUVWXYZ !@#

abcdefghijklmnopqrstuvwxyz 123

OLIVETTI DISTINCTIVE ELITE HEAVY FACE 12 Pitch

This is a sample of Distinctive
type face. Your particular typi
specific requirements. May we a
the most suitable type style for

ABCDEFGHIJKLMNOPQRSTUVWXYZ !@#

abcdefghijklmnopqrstuvwxyz 123

OLIVETTI FINANCIAL GOTHIC HEAVY FACE 12 Pitch

This is a sample of Financial Go
face. Your particular typing app
requirements. May we assist you
suitable type style for your neec

ABCDEFGHIJKLMNOPQRSTUVWXYZ

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OLIVETTI SANS SERIF ELITE 12 Pitch 6 lines to an inch

THIS IS A SAMPLE OF SANS SERIF EL
YOUR PARTICULAR TYPING APPLICATI
REQUIREMENTS. MAY WE ASSIST YOU
THE MOST SUITABLE TYPE STYLE FOR

ABCDEFGHIJKLMNOPQRSTUVWXYZ !@#$

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OLIVETTI UNIVERSAL ELITE #468 12 Pitch

This is a sample of Universal El
Your particular typing applicati
requirements. May we assist you
most suitable type style for your

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OLIVETTI ELITE STYMIE 12 Pitch 6 lines to an inch

This is a sample of Elite Stymie
Your particular typing applicati
requirements. May we assist you
the most suitable type style for

ABCDEFGHIJKLMNOPQRSTUVWXYZ !@

abcdefghijklmnopqrstuvwxyz 12

OLIVETTI ELITE ITALIC 12 Pitch 5.4 lines to an inch

This is a sample of Elite Italic
Your particular typing applicati
requirements. May we assist you
the most suitable type style for

ABCDEFGHIJKLMNOPQRSTUVWXYZ !@#$%

abcdefghijklmnopqrstuvwxyz 1234

OLIVETTI ELITE STYMIE HEAVY FACE 12 Pitch 6 lines to a

This is a sample of Elite Stymie
Your particular typing applicati
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